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Materials for a Flora of the Malayan Peninsula.—By Sir George King, K.C.I.E., LL.D., F.R.S., late Superintendent of the Royal Botanic Garden, Calcutta, and J. S. Gamble, C.I.E., F.R.S., late of the Indian Forest Department.

No. 16.

The present contribution commences with an account of the genus Psychotria, which concludes the Natural Order Rubiaceæ. In addition, it contains accounts of the Natural Orders Valerianeæ and Compositæ (prepared by Sir G. King); Stylidieæ, Goodenovieæ, and Campanulaceæ (prepared by Mr. Gamble); Vacciniaceæ and Ericaceæ (Sir G. King); Epacrideæ and Plumbagineæ (Mr. Gamble). For the new genera and species proposed in these Orders the authors are jointly responsible. The account of the Order Monotropeæ has been supplied by Lieut.-Col. Prain, F.R.S., Superintendent of the Royal Botanic Garden, Calcutta; and that of the Order Gentianeæ has been added, having been drawn up by Mr. C. B. Clarke, F.R.S., late President of the Linnean Society of London. It is somewhat out of its proper sequence, but has been included, as the descriptions were ready for publication.

In addition, therefore, to the account of the Rubiaceous genus *Psychotria*, with 29 Malayan Peninsular species, of which 11 are new to science, this fasciculus contains accounts of the Malayan members of 11 Natural Orders, including 48 genera and 81 species, of which 2 genera and 17 species are new to science.

Nat. Ord. LIX. RUBIACEÆ.

53. PSYCHOTRIA, Linn.

Shrubs or small trees, erect or occasionally climbing or twining; rarely herbs. Leaves opposite, rarely in whorls of 3 or 4. Stipules free in pairs, or connate, often with glands or hairs, deciduous or persistent. Flowers rather small, in terminal, rarely axillary, cymes

corymbs or fascicles, bracteolate or not, never involucrate (in the Malayan species). Calyx-tube short; the limb persistent in part or deciduous. Corolla-tube straight, short; the throat naked or hairy; the lobes of the mouth 5, rarely 4 to 6, valvate in bud. Stamens as many as the corolla-lobes, inserted on the throat or mouth; anthers linear or obtuse, attached dorsally near the base to short or long filaments. Ovary 2-celled; style long or short, bifid; ovules often cuneiform, solitary, erect from the base of each cell. Fruit small, baccate or drupe-like, ovoid globose or oblong, smooth or ridged, composed of two plano-convex, 1-celled, 1-seeded pyrenes; or didymous and separating into two cocci. Seeds plano-convex, the ventral surface grooved or plane, the dorsal smooth, ridged or sulcate; testa thin, albumen hard; embryo small, basal; cotyledons broad, thin; radicle inferior.—Distrib. Species about 550; tropical or sub-tropical.

Scandent:-Flowers 4-merous :--Panicles lax; leaves elliptic- or oblong-lanceolate .. 1. P. laxiflora. Flowers 5-merous :-Seeds with 4 ridges on the dorsal surface, the ventral surface plane :--Flowers sessile in small capitula at the ends of the branches of the cymes:-Leaves ovate to oblong-elliptic, 1.75 to 2.5 in. broad; inflorescence puberulous 2. P. morindæflora. Leaves narrowly elliptic, less than 1.25 in. broad; inflorescence coarsely pubescent .. 3. P. Maingayi. Flowers pedicellate in cymosely branched cymes:-Leaves elliptic-oblanceolate to elliptic, the midrib sometimes pubescent on the lower surface, otherwise glabrous; main-nerves 7 to 10 pairs; petioles .4 to ·75 in. long; fruit ·25 in. long 4. P. sarmentosa. Leaves narrowly elliptic-oblong, main-nerves 4 to 6 pairs; petioles .4 to .8 in. long; fruit .35 in. long ... 5. P. Kunstleri, Leaves broadly obovate or sub-ovate; main-nerves 5 to 10 pairs; petioles .5 to 1.5 in.; fruit .4 in. long.. 6. P. penangensis. Seeds with 3 ridges on the dorsal surface, the ventral surface plane :-Flowers pedicellate, in cymosely branched paniculate cymes; fruit narrowly ellipsoid 7. P Scortechinii. Flowers on short pedicels in globular cymes at the ends of the branches of the panicles :-Leaves and stems glabrous; fruit subglobose, 2 in. .. 8. P. pilulifera. Leaves and stems and inflorescence rusty-pubescent 9. P. ovoidea. Seeds with more than 4 ridges on both dorsal and ventral SUFFACENTRAL I 10. P. Ridleyi.

Seeds faintly ridged on the dorsal surface, the ventra surface with a shallow groove		. P. polycarpa.
Erect shrubs, usually small:—		
Flowers 4-merous:—		
	. 12	. P. calocarpa.
Flowers 5-merous:—		
Flowers shortly pedicellate, in dense globular cymules a the ends of the long-peduncled branches of a termina umbellate cyme; leaves deciduously puberulous, witi 9 to 13 pairs of main-nerves; fruit '3 in. long; seed 4-ridged on the dorsal surface, slightly concave on the	l n s	
가는 얼마나 있는 것 않아 무슨 없었다. 그는 살이 있는 사람들은 얼마나 그런 그는 그는 사람들이 사람들이 얼마나 가는 것이 없다는 사람들이 모르는 것이다.	. 13	. P. multicapitulate
		. P. tortilis.
Flowers in a terminal umbellately branching cyme:—		
Seeds with a single dorsal ridge, the ventral surface	•	
plane:—		
Leaves quite glabrous:—		
Leaves 6 to 10 in. long; main-nerves 12 to 18	•	
pairs	15.	. P. Griffithii.
Leaves usually under 6 in. long, main-nerves 8 to		
10 pairs	16.	P. angulata.
10 pairs		P. Helferiana.
Seeds with a single dorsal ridge, the ventral surface		
with a groove; leaves 5 to 8 in. long, quite glabrous,		
Seeds with 5 ridges on the dorsal surface, the ventual		P. montana.
surface plane:—		
Leaves glabrous :—		
Leaves oblong-elliptic to oblanceolate-elliptic, 3.5		
	19.	P. viridiflora.
Leaves softly pubescent:— Leaves elliptic to elliptic-oblong, the bases cuneate		
rounded or cordate, 3.5 to 5 in. long; fruit 25 to		
를 하는 것도 하면 있다. 그렇게 된 15명을 모았다. 모든 모양들은 이번 등 15명을 15명을 보다 이번 등 15명을 보는 것이다. (1977년 15일로 15명을 15명을 하는 것은 15명을 보다 (1	20	P. Birchiana.
Leaves elliptic, the upper surface glabrous except		1. Direntalia.
the midrib, 5 to 7 in. long; fruit 45 in. long		P. fulva.
Seeds 5-ridged on the dorsal surface and 2-grooved on		
the ventral; leaves glabrous on the upper surface,		
	22.	P. fulvoidea.
Seeds with 5 ridges on the dorsal surface and 1 ridge		
on the ventral; leaves glabrous, usually oblanceolate Seeds 4-ridged on the dorsal surface, plane on the	23.	P. stipulacea.
ventral:—		
Leaves elliptic, tapering equally to each end, 9- to		
10-nerved; calyx-lobes very long caudate-acuminate	24.	P. Curtisii.
Leaves obovate-oblong or obovate-oblanceolate, 10- to		
14-nerved; calyx-lobes short, broad, blunt	25.	P. rhinocerotis.
사람은 보고 살아왔는 수 없는 사람들의 전에 사람들이 가장 하는 이 중에서 살아가면 보면 보면 하는 것이 없다. 그런 사람들이 하는 것이다.	179.13	

SPECIES IMPERFECTLY KNOWN.

Psychotria Wrayi, No. 27.

- ,, inæqualis, No. 28.
- ,, condensa, No. 29.

1. PSYCHOTRIA LAXIFLORA, Blume Bijdr. 964. Scandent or epiphytic, glabrous except the inflorescence; young branches slightly thicker than a crow-quill, terete, dark-coloured, brown, shining. membranous, narrowly elliptic- or oblong-lanceolate, much acuminate, the base cuneate; both surfaces olivaceous-brown when dry, the lower the paler, midrib distinct; main-nerves 4 to 6 pairs, faint, curved, ascending: length 2 to 4 in.; breadth 5 to 1 in.; petiole 15 to 2 in. long. Stipules forming a tube from 15 to 3 in. long, sharply toothed. Panicles solitary, terminal, lax, more than half as long as the leaves, on naked peduncles about 1 in. long; branches cymose, with small acute bracteoles at their bases, puberulous. Flowers 15 to 2 in. long, puberulous, in cymules of three at the ends of the branchlets; their pedicels short, with broad acute caducous bracteoles at their bases. Calyx shortly funnel-shaped, the mouth sub-truncate or obscurely Corolla longer than the calyx, broadly clavate in bud, funnel-shaped; the mouth with 4 broad obtuse lobes, throat sericeous. Anthers 4, elliptic, blunt, sub-sessile. Fruit clavate-ellipsoid, with 8 vertical ridges (2 of them double), glabrous; seeds with 4 bold ridges on the dorsal surface; the ventral surface quite flat. Mig. Fl. Ind. Bat. II. 187.

SINGAPORE: Ridley 13, 4828. JOHORE: Ridley. PERAK: King's Collector 4117, 8428; Wray 110.—DISTRIB. Sumatra, Forbes 1297, 1309, 1710, 2466; Java, Koorders 23550B.

2. Psychotria morindæflora, Wall. Cat. 8438 A.B.C. in part. A woody climber, 15 to 20 feet long, glabrous except the puberulous inflorescence; young branches thinner than a goose-quill, dark brown when dry, terete, somewhat thickened at the nodes, the internodes minutely lenticellate and faintly striate. Leaves coriaceous, ovate to elliptic, sometimes oblong-lanceolate, shortly and rather bluntly acuminate, the base slightly cuneate or rarely rounded; upper surface olivaceous-greenish when dry, the lower purplish-brown; the midrib channelled on the upper surface, prominent on the lower; main-nerves 6 to 8 pairs, rather straight, spreading, thin but rather distinct on both surfaces when dry; length 3 to 4.5 in.; breadth 1.75 to 2.5 in.; petiole

·2 to ·5 in. Stipules caducous, leaving a pale narrow scar between the petioles. Cymes terminal, about 2 in., rarely 3 in. long; the branches compressed and angled, scurfy-puberulous, two of them springing from the base, the other three umbellate at the apex of the main axis, each bearing at its apex a dense, many-flowered, minutely bracteolate capitulum less than ·5 in. in diam. Flowers ·2 in. long, sessile. Calyx cupular, the mouth with 5 small blunt teeth. Corolla twice as long as the calyx; the mouth with 5 deep oblong blunt lobes; throat densely sericeous. Anthers 5, short, elliptic, basifixed on stout filaments. Style cylindric, thickened upwards; stigma of 2 broad lobes. Fruit short, compressed ovoid-elliptic, with 8 vertical ridges (2 of them double) crowned by the small calyx, ·25 in. long and ·15 in. in diam. from front to back; seeds with 4 dorsal ridges; ventral surface plane. Hook. fil. Fl. Br. Ind. III. 166. Psychotria? Wall. Cat. 8355.

Perak: King's Collector 2585, 2665; Scortechini 1826; Wray 4001. Penang: Wallich; Curtis 478.

3. Psychotria Maingayi, Hook. fil. Fl. Br. Ind. III. 166. A slender woody climber; young branches half as thick as a goose-quill, pubescent, ultimately pale and glabrous. Leaves thickly membranous, narrowly elliptic, caudate-acuminate, the base much narrowed; both surfaces glabrous, when dry pale olivaceous, the upper rather the darker; main-nerves about 6 pairs, indistinct on both surfaces like the midrib; length 2 to 3.25 in.; breadth .65 to 1.2 in.; petiole .1 to .2 in., slender. Stipules cartilaginous, persistent, connate into a tube .15 in. long with a few hairs at the truncate and toothed or acute apex. Cymes axillary, on slender, compressed, coarsely pubescent peduncles shorter than the leaves, few-branched. Flowers sessile, bracteoles linear. Calyx much longer than the pubescent ovary, widely campanulate; the lobes ovate-triangular, caudate-acuminate, spreading. Corolla unknown. Fruit broadly ellipsoid, with 8 deep vertical grooves, pale, nearly glabrous when ripe, .2 in. long.

SINGAPORE: Maingay (K.D.) 926; Ridley 6924.

4. PSYCHOTRIA SARMENTOSA, Blume Bijdr. 964. Scandent; woody; young stems thinner than a goose-quill, pale, glabrous. Leaves thinly coriaceous, elliptic-oblanceolate to elliptic, acute or shortly and abruptly acuminate, much narrowed at the base, edges slightly recurved; both surfaces pale brown tinged with olivaceous when dry, minutely reticulate; the upper glabrous, the lower sometimes pubescent only on the stout midrib; main-nerves 7 to 10 pairs, curving slightly upwards, faint; length 2.5 to 4 in.; breadth 1 to 1.75 in.; petioles .4 to .75 in., winged above. Stipules broad at the base, the apex caudate-acuminate.

Cymes terminal, puberulous, shorter than the leaves, on short peduncles, cymosely branched; the branches angled, spreading, many-flowered; bracteoles minute, linear. Flowers about 15 in. long, puberulous outside, on short pedicels. Calyx campanulate, with 5 short triangular teeth. Corolla villous at the base in the interior. Fruit ellipsoid, 25 in. long, with 10 vertical ridges (2 of them double). Seeds with 4 dorsal ridges, the ventral surface plane. DC. Prod. IV. 522; Wight Ic. 1038; Thwaites Enum. Pl. Ceyl. 148; Kurz For. Fl. Burm. II. 14; Hook. fil. Fl. Br. Ind. III. 165. P. obovata, Wall. Cat. 8380. Grumilea Junghuhniana, Miq. Fl. Ind. Bat. II. 296. Psychotria sp., Wall. Cat. 8382, 8352?, 8384.

SINGAPORE: Ridley 2874, 2875, 9112. MALACCA: Griffith (K.D.) 3043. Perak: King's Collector 4967, 7572. Penang: King 1346; Curtis 951, 2781.—Distrib. Burma, Wallich; Helfer (K.D.) 3041, &c.; Indian Peninsula; Ceylon; Malay Archipelago; Andaman Islands.

VAR. pachyphylla, King & Gamble. Leaves thickly coriaceous, shining, greenish when dry, 3 to 4 in. long; fruit :25 in. long, subglobular.

PENANG: Ridley 9363; Curtis 2215.

5. PSYCHOTRIA KUNSTLERI, n. sp., King & Gamble. A glabrous epiphyte with slightly angled stems thinner than a goose-quill, pale vellowish when dry. Leaves succulent, glossy and bluish-green when fresh, but yellow on both surfaces and dull when dry, narrowly ellipticoblong, rarely oblong-oblanceolate, gradually and equally tapering to each end; the midrib bold, channelled on the upper surface; mainnerves 4 to 6 pairs, spreading, very indistinct; length 3 to 5.5 in.; breadth ·8 to 1·4 in.; petioles ·4 to ·8 in. long. Stipules forming a cartilaginous persistent cup with an entire mouth, about 1 in. long. Cyme solitary, umbellate, terminal, longer than the leaves (the naked peduncle of 2 to 3 in. being included), lax, from 2 to 4 in. broad; branches spreading, dividing near their apices into umbellate cymes; bracteoles few, linear, acute. Flowers not seen: on basally bracteolate pedicels as long as themselves. Fruit 35 in. long, ellipsoid, deeply 10-grooved, crowned by the rather large remains of the 5-toothed calyx, 10-ridged. Seeds dorsally 4-ridged, the ventral surface flat.

Perak: Scortechini; King's Collector 1886, 4953, 6588; Wray 2230.—Distrib. Sumatra, Forbes 2823.

6. PSYCHOTRIA PENANGENSIS, Hook, fil. Fl. Br. Ind. III. 175. A shrubby epiphyte or climber, 8 to 12 feet long, all parts except the inflorescence glabrous; young branches slightly compressed, thinner than a goose-quill, dark-coloured. *Leaves* thinly coriaceous, broadly elliptic-obovate or sub-ovate, shortly and abruptly triangular, acumi-

nate, much narrowed at the base into the broad petiole; both surfaces brown when dry, the upper slightly olivaceous; the midrib broad, channelled on the upper surface, main-nerves 5 to 10 pairs, spreading, thin, distinct on the lower surface; length 3 to 4.5 in.; breadth 1.5 to 2.5 in.; petiole .5 to 1.5 in. long, slightly winged above. Stipules broadly ovate, sub-acute or blunt, sub-tubular, sometimes bifid, ·2 to ·4 in. long. Cymes umbellate, solitary or terminal. pedunculate, as long as or longer than the leaves (including the compressed naked 1 to 2 in. long peduncle); primary branches long, spreading; the ultimate umbels with broad-based subulate unequal bracteoles. Flowers 2 to 25 in. long, sessile or on short pedicels: bracts 25 in. long. Calyx-tube obconic, its teeth triangular. Corolla longer than the calyx, shortly and widely tubular, deeply divided into 5 broad lobes thickened near the apex, the apex itself sharp and inflexed, glabrous inside except for the ring of hair in the throat at the insertion of the short filaments. Anthers elliptic, blunt, entire. Fruit ellipsoid, compressed, with 10 obtuse vertical ridges (2 of them double), glabrescent, crowned by the rather large calvx; length '4 in.; breadth 25 in. Seeds 2, plano-convex, the dorsal surface with 4 blunt ridges, the ventral surface plane.

Malacca: Maingay (K.D.) 920. SINGAPORE: Ridley 2870. PERAK: Scortechini 2034; King's Collector 3049, 4591, 10723. SELANGOR: Ridley 7425. Pangkore: Curtis 1621.

7. PSYCHOTRIA SCORTECHINII, n. sp., King & Gamble. A climber, all parts glabrous; young branches pale brown, thicker than a crowquill, terete, smooth. Leaves membranous, ovate-lanceolate or narrowly elliptic, acuminate, the base narrowed or rarely rounded; both surfaces brown when dry (the lower slightly paler), the midrib prominent; mainnerves 5 or 6 pairs, curved, spreading, not prominent; length 2.5 to 4 in.; breadth 1 to 1.5 in.; petiole .15 to .2 in. Stipules oblong, acute, connate at their bases, 15 to 2 in, long, caducous. Cymes paniculate, solitary, terminal, rarely axillary, spreading, lax, cymosely branched, in flower as long as or nearly as long as the leaves, in fruit longer, the branches bracteolate, angled, divaricating. Flowers on the ultimate branchlets in threes, 15 in. long, on short pedicels, each with a bracteole at the base. Calyx cupular, with 5 short acute teeth. Corolla longer than the calyx, cylindric, with short triangular lobes, the throat with tufts of yellowish hairs between the 5 stamens. Anthers on short filaments. Style cylindric, stigma 2-lobed. Fruit narrowly ellipsoid, tapering to each end, sometimes clavate, slightly compressed, 8-ridged (2 being double), crowned by the calvx, 35 in. long and 2 in. in diam. Seeds with 3 broad dorsal ridges, ventral surface plane.

Perak: Scortechini 311, 404, 426; King's Collector 897, 2566, 5373.

This closely resembles P. laxiflora, Bl., but has 5-merous flowers and longer, less clavate fruit.

8. PSYCHOTRIA PILULIFERA, n. sp., King & Gamble. A small tree or climber; all parts except the inflorescence glabrous; young branches about as thick as a crow-quill, terete, pale brown when dry. Leaves coriaceous, narrowly elliptic, much tapered to both ends; both surfaces olivaceous when dry, the lower slightly the paler; main-nerves 6 or 7 pairs, inconspicuous, the midrib bold beneath when dry; length 2.5 to 3.5 in.; breadth .75 to 1 in.; petiole .35 to .4 in. long, slender. Inflorescence a terminal, few-branched, puberulous panicle of condensed 8-10flowered globular cymes. Flowers and their short pedicels minutely tomentose. Calyx shortly campanulate, the mouth with 5 spreading triangular acute lobes. Corolla tubular; the lobes oblong, broad, with small inflexed apices. Anthers 5, attached to the throat by short filaments surrounded by coarse hair. Fruit sub-globose, with 10 bold vertical ridges (2 of them double), crowned by the small calyx, 2 long and 15 in. in diam. Seeds with 3 bold ridges on the dorsal surface; ventral surface plane.

Perak, at elevations of 3,000 to 5,000 feet: Wray 287, 398, 434, 946, 3870.

9. Psychotria ovoidea, Wall. Cat. 8383. A slender woody climber. 20 to 40 feet long; stems thinner than a goose-quill, densely rusty-Leaves with recurved margins, coriaceous, ovate- or elliptic-lanceolate, shortly acuminate, the base cuneate or rounded. sometimes minutely cordate; upper surface olivaceous when dry, glabrous, the main-nerves depressed; the lower brown, pubescent on the stout midrib and 5 to 7 pairs of prominent curved ascending mainnerves, puberulous on the interspaces; length 1.5 to 2.5 in.; breadth .85 to 1.25 in.; petioles 15 to 25 in. long. Stipules connate, ovate-lanceolate, 25 in. long, caducous. Cymes 75 to 2 in. in diam., trichotomous, solitary, terminal, rusty-pubescent, on angled peduncles .5 to 1 in. long. Flowers about 15 in. long, on short pedicels, crowded in dense cymes at the ends of the branches and mixed with linear bracteoles. Calyx campanulate, with 5 spreading acute teeth. Corolla twice as long as the calyx, salver-shaped, with 5 lobes, the tube villous inside. Fruit ovoid-globose, 15 in. long, the apex crowned by the calyx, the sides with 6 faint vertical ridges. Seeds faintly 3-ridged on the dorsal surface; the ventral surface broad, flat. Hook. fil. Fl. Br. Ind. III. 166.

SINGAPORE: Wallich, Seeman 2348. MALACCA: Maingay (K.D.) 923; Ridley 97, 8407.

10. PSYCHOTRIA RIDLEYI, n. sp., King & Gamble. A small shrub; all parts glabrous except the inflorescence; stems half as thick as a goose-quill, terete, greenish when dry. Leaves membranous, oblongto elliptic-oblanceolate, the apex abruptly and very shortly acuminate, the base much narrowed, both surfaces pale olivaceous when dry, the midrib rather prominent, the upper sometimes with scattered minute, adpressed white hairs; main-nerves 7 to 9 pairs, slightly curved, spreading, faint on both surfaces; length 3 to 5.5 in.; breadth 1.25 to 2.25 in.; petioles ·4 to ·8 in. long, winged near the apex. Stipules broadly ovate, subacute, 1 in. long. Cyme on a peduncle about 1 in. long (longer in fruit), corymbosely branched, the bracts at the forks linear-lanceolate. Flowers in cymules of three, everywhere canescent, on short pedicels bibracteolate at the base. Calyx campanulate with elongated tube; the mouth with 5 erect ovate-triangular lobes. Corolla longer than the calyx; the tube short, slightly villous at the base near the insertion of the broad sub-sessile anthers; the 5 lobes broadly ovate, acute. Fruit ovoid-ellipsoid, 12-ridged, crowned by the small calvx, 3 to 4 in. long. Seeds many-ridged on both dorsal and ventral surfaces.

SINGAPORE: Ridley 48, 10818. Johore: Ridley 6472. Malacca: on Mt. Ophir, Hullett 811; Goodenough 1363.

11. PSYCHOTRIA POLYCARPA, Hook. fil. Fl. Br. Ind. III. 165. A climber, glabrous except the inflorescence; young branches thinner than a goose-quill, terete, when dry dark-coloured. Leaves coriaceous, ovate- or obovate-lanceolate to obovate- or ovate-rotund, the apex in the narrower forms shortly and bluntly acuminate, in the broader abruptly and bluntly apiculate; both surfaces olivaceous when dry, the upper somewhat shining, the lower dull and darker, the midrib prominent on both; main-nerves 5 or 6 pairs, spreading, faint on both surfaces; length 2 to 3 in.; breadth .75 to 1.75 in.; petioles .3 to .6 in. Stipules very short, connate to form a collar, caducous. Panicles large, umbellately cymose, longer than the leaves (sometimes very much so); their branches numerous, spreading, puberulous, with minute bracteoles at the divisions. Flowers 15 in. long, numerous, in ultimate cymules of 2 or 3, shortly pedicellate. Calyx thick, minutely pubescent, shortly campanulate or sub-cupular, the mouth with 5 acute teeth or subentire. Corolla longer than the calyx, salver-shaped, its 5 lobes spreading, lanceolate, acute, the throat sericeous; anthers 5, elliptic. Fruit ellipsoid, tapered to the base, and the apex crowned by the rather large remains of the calyx; obscurely ridged; 15 in. long and 1 in. in diam.; sometimes sub-globular, the epicarp somewhat pulpy. Seeds slightly convex and faintly ridged on the dorsal surface, the ventral with a broad

shallow groove. P. obovata, Wall. Cat. 8380A. Grumilea polycarpa, Miq. Fl. Ind. Bat. II. 295.

SINGAPORE: Ridley 2029. MALACCA: Griffith (K.D.) 3042; Maingay (K.D.) 924; Hullett 402. Johore: Ridley 4090, 11160. Penang: Curtis 1095. Perak: Wray and King's Collector many numbers. Distrib.—Java, King; Forbes 1061; Koorders 28043B.

12. PSYCHOTRIA CALOCARPA, Kurz in Journ. As. Soc. Beng., 1872, II. 315. A glabrous shrub 2 to 4 feet high; young branches thinner than a goose-quill, dark-coloured when dry. Leaves thickly membranous, oblong-oblanceolate or oblanceolate, shortly caudate-acuminate at the apex, much attenuate at the base, the edges sometimes broadly crenate; both surfaces olivaceous when dry, the midrib and nerves broad, distinct and pale; main-nerves 10 to 12 pairs, slightly curved, spreading and interarching to form a bold pale intramarginal nerve 1 to 15 in. from the edge; length 5 to 8 in.; breadth 1.65 to 2.5 in.; petiole .75 to 1.25 in., slightly winged near the apex. Stipules broadly triangular, acuminate, membranous, sometimes bifid, 2 in. long. Cymes terminal or axillary, sessile or shortly pedunculate, shorter than the petioles, about 1.25 in. across and 5 in. long, branched from near the base, the branches compressed, trichotomous; the bracteoles lanceolate, acuminate. Flowers 2 in. long, on short pedicels. Calyx with a short cylindric tube and 4 longer oblong blunt sub-erect concave lobes. Corolla exceeding the calyx, narrowly campanulate, bluntly 4-lobed, the throat densely sericeous, otherwise glabrous. Fruit sub-globose or ovoid, sub-compressed; the epicarp fleshy, glabrous, rugulose when dry; 3 in. in breadth and rather less in length, the persistent calyxlobes small. Seeds large, the dorsal surface faintly 1-ridged, the ventral deeply grooved. Kurz For. Fl. Burm. II. 9; Hook. fil. Fl. Br. Ind. III. 173. P. asiatica, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 160; Wall. Cat. 8331: not of Linn. nor of Roxb. P. viridiflora, Reinw. var. undulata, Kurz For. Fl. Burm. II. 13. P. picta, Wall. Cat. 8353; and Psychotria, l.c. 8359.

Perak: Ridley 7199; Wray 2200; King's Collector 1930, 2348, 6798, 10772; Scortechini. Malacca: Hervey.—Distrib. Himalaya, Assam, Burma.

This plant is very common in the lower Himalaya, Assam, and Burma. In the Flora of British India it is described as herbaceous, but the Malayan specimens are all woody. The leaves are always readily distinguished, when dry, by the pale broad mainnerves and by the very conspicuous intra-marginal nerve. In Malaya the plant is glabrous, but in the Indian specimens the under surfaces of the leaves are deciduously puberulous.

^{13.} Psychotria multicapitata, n. sp. King & Gamble. An erect

much-branched shrub 3 to 7 feet high; young branches thinner than a goose-quill, slightly compressed, swollen at the nodes, pale, deciduously puberulous. Leaves thinly membranous, greenish when dry, broadly obovate-lanceolate, oblong or elliptic, abruptly and shortly caudateacuminate, the base narrowed to the rather short petiole; upper surface quite glabrous; the lower scurfy-puberulous on the broad midrib and 9 to 13 pairs of curved spreading main-nerves; length 5 to 10 in.; breadth 2.5 to 4 in.; petiole .75 to 1.15 in. Stipules free, broadly triangular, 15 in. long. Cymes terminal, solitary, peduncled, about 2 in. long (including the peduncle) and the same in breadth, umbellately branched from near the base; the ultimate branches numerous, bearing terminal many-flowered globular minutely bracteolate cymules, about 5 in. in diam., the common peduncle about an inch or more long, the branches shorter, all puberulous. Flowers on short puberulous pedicels, ovoid in bud, about 15 in. long when expanded. Calyx cupular, with 5 or 6 triangular acute sub-erect teeth. Corolla longer than the calyx, the tube cylindric and, like the throat, densely white-sericeous inside; lobes of the limb short, triangular, deflexed. Anthers bifid at the base. Style thick, bifid, longer than the corolla. Fruit ellipsoid-obovoid, 10-ridged, crowned by the small calyx, glabrous, 3 in. long. Seed dorsally with 4 faint ridges, ventrally somewhat concave.

Perak: Scortechini 214, 291; King's Collector 436, 867, 2862, 5402, 7380, 7513, 10559.

14. PSCHYOTRIA TORTILIS, Blume Bijdr. 958. Stem woody below, erect, 6 to 18 in. high, not branched, cinereous, 4-angled, sparsely covered with short coarse scurfy hairs. Leaves membranous, broadly elliptic or ovate-elliptic, the apex acute or sub-acute, narrowed from below the middle to the petiole; upper surface when dry dark green, the lower pale, glaucous, minutely lepidote; the 8 to 11 pairs of slightly curved spreading main-nerves covered with minute short coarse deciduous dark-coloured hairs; length 4 to 6 in.; breadth 1.75 to 3 in.; petioles 5 to 2 in., compressed, scurfy-pubescent. Stipules broadly triangular, much acuminate, bifid, 15 to 3 in. long. Cymes solitary, sessile, axillary, dichotomous, many-flowered, condensed, 5 in. to 1 in. long and as much broad. Flowers 15 in. long, on short ebracteolate pedicels. Calyx campanulate, with 5 triangular spreading teeth, covered with coarse hair. Corolla longer than the calyx, narrowly campanulate, with 5 ovate acute lobes, hairy like the calyx. Anthers 5, sessile, oblong, blunt, included. Style shorter than the calyx; stigmas short, linear, divergent. Fruit crowned by the small calvx-lobes, reniform, pale with numerous short vertical brown streaks, and stiff short white hairs, '1 in. broad and less in length; the dorsal surface of each of the two cartilaginous cocci with 3 bold ridges. Seeds bluntly 5-ridged on the dorsal, broadly grooved on the ventral surface. DC. Prod. IV. 520; Hook. fil. Fl. Br. Ind. III. 169. P. microcarpa, Wall. Cat. 8344. Streblosa tortilis, Korth. Kruidk. Arch. II. 246.

Penang: Wallich 8344; Curtis 405, 1269. Singapore: Lobb. Perak: King's Collector 710, 2627; Scortechini.—Distrib. Sumatra, Forbes 1495.

15. PSYCHOTRIA GRIFFITHII, Hook. fil. Fl. Br. Ind. III. 171. A shrub; glabrous except the puberulous inflorescence; young branches thinner than a goose-quill, terete, of a dark colour when dry. Leaves coriaceous, oblong or elliptic, shortly and somewhat abruptly acuminate, the base cuneate, the edges slightly recurved and pale, both surfaces drying olivaceous-green, shining, the midrib and the 12 to 15 pairs of curved spreading main-nerves distinct; length 6 to 10 in.; breadth 1.75 to 3.5 in.; petiole .4 to .8 in., slightly winged above, stout. Stipules broadly triangular, sub-acute, 2 to 3 in. long. Cymes terminal, solitary, pyramidal, about 1.5 in. long and the same in breadth, on naked compressed peduncles 1.5 in. or more long (lengthening to 2 in. or more in fruit); branches short, stout, puberulous, ebracteolate; the ultimate ones bearing the shortly pedicelled flowers in cymules of three. Flowers 2 in. long. Calyx campanulate, with 5 broadly triangular acute sub-erect teeth. Corolla as long as the calyx, fleshy, tubular, with 5 broad oblong hooded lobes; the tube finely sericeous inside, otherwise glabrous. Anthers 5, broadly oblong, entire, dorsifixed; the filaments thin, compressed, broad. Style short, with 2 broad flat lobes. Fruit elliptic, slightly obovoid, the apex subtruncate, crowned by the remains of the disk and calvx, glabrous, black when dry, 4 in long and 35 in broad; with 4 broad vertical ridges, two of them grooved externally and consisting of two ridges united, the other two single; 2-celled, and 2-seeded. Seeds large, the dorsal surface with a single ridge, the ventral flat, not grooved, everywhere smooth.

Malacca: Griffith (K.D.) 3044; Maingay (K.D.) 918; Hervey; Derry 367. Perak: Ridley 2873. Singapore: Ridley 2872, 2873, 6314, 6468, 6556; Hullett 848.

16. PSYCHOTRIA ANGULATA, Korth. in Ned. Kruidk. Arch. II. 243. A shrub 4 to 6 ft. high, glabrous except the inflorescence; young branches pale brown when dry, thinner than a goose-quill, terete. Leaves coriaceous, oblanceolate to oblanceolate-elliptic, the apex shortly and rather abruptly acuminate, the base much narrowed; both surfaces brown when dry, tinged with olivaceous; the upper very shining, the broad midrib and nerves depressed; the lower less shining, the midrib

very prominent, and the 8 to 10 pairs of spreading nerves thin but distinct; length 4 to 6 in.; breadth 1 to 1.75 in.; petiole 2 to 5 in., slightly winged near the apex. Stipules broadly triangular, acute, subacute or bifid, 25 in. long. Cyme solitary, terminal, pyramidal, about 1.5 in. long, on a naked peduncle 1.25 to 3 in. long; branches whorled, shortly bracteolate at their bases, spreading; the ultimate branchlets crowded at their ends with numerous sessile flowers 25 in. long. Calyx pale, widely cupular, 05 in. long, with irregular small teeth. Corolla thick, tubular, its 5 broad lobes with acute inflexed apices; the throat densely sericeous. Anthers elliptic, blunt, on short filaments. Fruit ovoid or narrowly obovoid, pulpy, obscurely ridged, glabrous, crowned by the small calyx, 5 in. long and half as much broad (unripe), 2-celled. Seeds 2, plano-convex. Miq. in Ann. Mus. Lugd. Bat. IV. 210; Hook. fil. Fl. Br. Ind. III. 172. Psychotria, Wall. Cat. 8348. Chasalia perforata, Miq. Fl. Ind. Bat. Suppl. 546.

Malacca: Griffith (K.D.) 3037. Province Wellesley: Ridley 7026. Johore: Ridley 11161. Singapore: Ridley 2867. Pahang: Ridley 1353. Penang: Curtis 14, 726; King's Collector 1683. Perak: King's Collector 4170.—Distrib. Burma.

17. PSYCHOTRIA HELFERIANA, Kurz in Journ. As. Soc. Beng., 1872, II. 314. A shrub; the whole plant more or less rusty-pubescent; young branches as thick as a goose-quill or thicker, the pubescence dense and deciduous. Leaves thickly membranous, elliptic or oblongelliptic, rarely obovate-elliptic, the apex acuminate, the base usually cuneate but sometimes rounded; both surfaces dark brown when dry, the lower somewhat tinged with red and less hairy than the upper; the hairs on both adpressed and very numerous on the stout midrib, less so on the 9 to 16 pairs of spreading curved main-nerves; length 6 to 12 in.; breadth 2.5 to 4.5 in.; petioles 1 to 1.75 in. Stipules broadly ovate to oblong-lanceolate, often as much as 1 in. long, the apex acuminately bifid. Flowers · 2 in. long, numerous, mixed with many unequal bracteoles mostly longer than themselves, all acuminate and some of them bifid and crowded in dense pedunculate capitula in a few-branched axillary cyme usually shorter than the leaf-petioles. Calyx-tube narrowly campanulate, with 5 lanceolate erect lobes nearly as long as itself, everywhere pilose. Corolla similar to the calvx, but smaller and less hairy. Stamens almost sessile; anthers broad, blunt. Fruit ovoid or ellipsoid, somewhat compressed and boldly 8-ridged, crowned by the lobes of the calyx, 3 in. long and 2 in. in diam. Kurz For. Fl. Burm, II. 11: Hook, fil. Fl. Br. Ind. III. 172.

SINGAPORE: Wallich 8368; Goodenough 184; Maingay (K.D.) 921.
MALACCA: Maingay (K.D.) 921; Ridley 184; Lobb. Johore: Ridley

#111

11159; King; Hullett 507. Perak: King's Collector 4345, 4661.
—Distrib. Burma.

VAR. diffusa, King & Gamble. Capitula in spreading pedunculate panicles several inches in diam.

PERAK: Scortechini 400. Johore: Ridley 3732. SINGAPORE: Hullett.

VAR. angustifolia, King & Gamble. Leaves elliptic-oblong or oblong, not more than 2 in. in width; capitulum solitary, sessile.

SINGAPORE: King.—DISTRIB. Andamans.

VAR. glabra, King & Gamble. Leaves glabrous.

PERAK: Wray 1963.

18. PSYCHOTRIA MONTANA, Blume Bijdr. 960. A stout glabrous shrub; young branches half as thick as a goose-quill, angled, brown when dry. Leaves thinly membranous, on rather long petioles, elliptic or ellipticoblong, acuminate, the base cuneate; both surfaces greenish or olivaceous-brown when dry, the lower the paler; main-nerves 7 to 8 pairs (rarely 10 pairs) curving upwards, pale and bold like the midrib on the lower surface, faint on the upper; length 5 to 8 in.; breadth 1.75 to 3.5 in.; petioles 4 to 1.25 in., winged near the apex. connate by their short broad bases, the apices caudate-acuminate, curved. Cymes terminal, paniculate, on angled peduncles 5 to 1.25 in. in length; branches spreading, angled, bearing numerous shortly pedicelled flowers in cymules of three. Flowers 25 in. long. cupular with 5 broad spreading triangular teeth. Corolla with subcampanulate tube having a broad band of hairs inside in the upper half; the lobes of the mouth 5, broad, acute, reflexed. Fruit ellipsoidovoid to ellipsoid, boldly 4-ridged, glabrous, 25 to 3 in. long. Seeds: the dorsal surface with a single ridge, the ventral deeply concave. grooved. DC. Prod. IV. 521; Hook, fil. Fl. Br. Ind. III. 174. P. viridissima, Kurz in Journ. As. Soc. Beng. 1872, II. 315; For. Fl. Burm. II. 13. Chasalia montana, Miq. Fl. Ind. Bat. II. 281. C. expansa, var. montana, Miq. MS. Psychotria, Wall. Cat. 8371, 8378, and Rubiacea, 8339. Coffea tabaccifolia, Wall. Cat. 8334.

Perak: Scortechini; Ridley, 2922; King's Collector, 452, 2190; Wray 276.—Distrib. Sumatra, Forbes 1566, 1862, 2201, 2241, 2330. Java: Blume; Forbes 271, 759, &c. Burma; Assam; Sylhet (Griffith, K.D.) 3047.

VAR. brevipetiolata, King & Gamble. Leaves with petioles 2 to 4 in. long.

Perak: Scortechini 277, 1513; Wray 1628, 2289; King's Collector 389, 922, 1954, 2190, 4707, 6111, 8596. Selangor: Ridley 10583. Pahang: Ridley 5831. Malacca: on Mt. Ophir, Hullett 762

19. Psychotria viridiflora, Reinw. ex Blume Bijdr. 965. A small tree or a bush, all parts, except the inflorescence, glabrous; young branches thinner than a goose-quill, dark brown. Leaves membranous. oblong-elliptic to oblanceolate-elliptic, shortly and stoutly acuminate, the base much narrowed; both surfaces brown when dry; main-nerves 8 to 14 pairs, curved, spreading, rather faint on both surfaces: length 3.5 to 8 in.; breadth 1.25 to 2.5 in.; petiole .4 to .75 in. occasionally as much as 1.25 in. long. Stipules broadly oblong, narrowed to the apex, but not acute, 3 to 5 in. long, deciduous. Cymes on naked peduncles (3 to 1.5 in. long) in broad panicles 1 to 2 in. long and as much wide (more when in fruit); branches divaricating, puberulous, with small broad bracteoles. Flowers in small cymes, on the ultimate branches, ·1 in. long, on short pedicels, glabrous outside. Calyx cupular with irregular, short, sharp teeth. Corolla longer than the calyx, widely tubular, with 5 broad sub-acute lobes; the throat sericeous. Anthers 5, oblong, blunt, attached by short filaments in the throat. Fruit elliptic, with a wide shallow areola on the apex, the sides with 10 bold vertical ridges (2 of them double), glabrous, about 25 in. long and 2 in. in diam. Seeds plano-convex, the convexity deeply 5-grooved, the ventral surface flat. P. sulcata, Wall. Cat. 8370; Hook. fil. Fl. Br. Ind. III. 168. P. Jackii, Hook, fil. Fl. Br. Ind. III. 167.

Malacca: Griffith (K.D.) 3021; Goodenough 1878; Derry 457, 1224; Ridley 1600. Pangkore: Curtis 1369. Trang: Wray 2778. Negri Sembilan: Ridley 1930. Selangor: Ridley 7434. Perak: Scortechini; Ridley 2919, 3067; Wray 290, 2027, 2778, 2956; King's Collector 2655, 4275, 4374, 5964, 6327, 7224. Penang: Wallich 8343, 8370.—Distrib. Burma, Helfer & Griffith (K.D.) 3040; Sumatra, Forbes; Java, Blume; Borneo, Beccari; Motley; Haviland.

20. PSYCHOTRIA BIRCHIANA, n. sp., King & Gamble. Herbaceous; woody at the base; all parts softly rusty-pubescent; stems 6 to 18 in. high, thinner than a goose-quill, their pubescence crisped, dense, coarse, and entirely or partly deciduous. Leaves thickly membranous, elliptic to elliptic-oblong, sometimes sub-obovate, acute, the base rounded or minutely cordate or sometimes cuneate; both surfaces brown when dry, the lower sometimes paler and with fewer hairs; the midrib prominent and very hairy on both sides, the 10 to 12 pairs of rather faint little-curved spreading main-nerves less hairy than the midrib; length 3.5 to 5 in.; breadth 1.5 to 2.25 in.; petiole 5 to 1 in., covered with coarse tomentum mixed with ovate-acuminate scales. Stipules oblong-ovate, acuminate, 5 to 75 in. long. Cymes pedunculate, solitary, terminal, spreading, 1.5 to 2 in. across, and about as long, the branches spreading, bracteate at the divisions, the bracts lanceolate,

acute, reflexed, '2 or '3 in. long; the peduncle 1.5 to 2.5 in. long, scaly, tomentose; ultimate branches short, bearing at their apices dense capitules of small sub-sessile flowers, mixed with short broad bracteoles. Flowers about '1 in. long. Calyx cupular-campanulate, pubescent; the mouth wide and with 5 blunt, triangular, spreading lobes. Corolla exceeding the calyx, widely tubular, with 5 or 6 short inflexed teeth, glabrous inside, hairy outside. Anthers oblong, blunt at each end, the filaments short. Fruit ellipsoid, tapering equally to each end, boldly 10-ridged, somewhat compressed, crowned by the hairy calyxlobes, otherwise sub-glabrous, '25 to '3 in. long and '2 in. across. Seeds with 5 dorsal ridges, the ventral surface plane.

Perak, on Birch's Hill, elev. 4,000 feet: Scortechini 258; Wray 1; King's Collector 2134, 2950, 7348. Selangor: Ridley 7432.

The flowers are described as white, and the ripe fruit as cherry red. Named in honour of Mr. Birch, a British civil officer, who was murdered by the aborigines in Perak.

21. PSYCHOTRIA FULVA, Buch.-Ham. ex. Wall. Cat. 8366, excl. B. A shrub; young branches thinner than a goose-quill, dark brown when dry, bearing a few scattered coarse hairs. Leaves thickly membranous, elliptic, shortly acuminate and tapering almost equally to the base; upper surface without hairs except a few on the midrib near the base. under surface with dark cinereous pubescence on the midrib and 15 to 18 pairs of sub-horizontal slightly curved main-nerves; length 5 to 7 in., breadth 1.75 to 3.5 in.; petioles 1.25 to 2.4 in., coarsely and deciduously pubescent. Stipules membranous, broadly oblong, the apex deeply and acuminately bifid, the edges coarsely ciliate; length about 1 in. Cymes pedunculate, axillary, trichotomous, the flowers in condensed capitular cymes at the ends of the short branches, enveloped when in bud in 2 or 3 large deciduous bracts; in fruit about 2 in, across and less in length; peduncles about 2 in. long; branches about 5 in. long, horizontal; all, like the short flower pedicels, coarsely rusty-pubescent. Calyx cupular, with 5 deep, spreading, narrow, acuminate lobes. Corolla not seen. Fruit narrowly elliptic, somewhat compressed, tapering slightly to each end, the apex crowned by the erect connivent calyxlobes, boldly but somewhat unequally 12-ridged, glabrous, 45 in. long and 25 in. in diam. Seeds 5-ridged on the dorsal, the ventral surface flat. Hook. fil. Fl. Br. Ind. III. 169, excl. syn. P. monticola, Kurz. Psychotria, Wall. Cat. 8337; Griff. Notulæ, IV. 268; Ic. Pl. Asiat. t. 479, f. 2.

Perak, On Ulu Batung Padang: Wray 1615.—DISTRIB. E. Bengal, Griffith (K.D.) 3022, 3034, 3035, 3036; Khasia, Hook f. & Thoms. 14.

P. monticola, Kurz, a Burmese plant, has been reduced to P. fulva, Buch.-Ham., but in my opinion it is quite distinct.

22. PSYCHOTRIA FULVOIDEA, n. sp., King & Gamble. A small shrub; young branches thinner than a goose-quill, dark-coloured, Leaves membranous, narrowly elliptic, acuminate, crenulate, the base cuneate; upper surface glabrous, dark brown when dry, the lower reddish-brown; the midrib, nerves and reticulations rustypubescent, otherwise glabrous; midrib prominent on both surfaces, the 10 to 14 pairs of spreading, curving main-nerves slightly prominent on the lower; length 6 to 7 in.; breadth 2 to 2.5 in.; petiole 1 to Stipules membranous, ovate, caudate-acuminate, the edges irregularly serrate, ciliate, length about 1 in. Cymes axillary, trichotomous, condensed, about 2 in. broad when in fruit and 1.25 in. long, on deflexed, coarsely but shortly pubescent peduncles 3 in. long; their branches short, spreading, bracteate at the divisions and coarsely pubescent. Flowers condensed into globose capitulate cymes at the apices of the branches, sessile. Calyx narrowly campanulate, pubescent, with 5 erect acute teeth. Corolla unknown. Fruit narrowly elliptic, tapering to each end, the apex crowned by the short pubescent lobes, with 12 deep ridges and grooves, glabrous, 4 in. long and 2 in. in diam. Seed dorsally 5-ridged, ventrally 2-grooved.

PERAK: Scortechini 538.

This approaches P. fulva, but is a smaller plant, with crenulate leaves quite glabrous on the upper surface and nearly so on the lower.

23. PSYCHOTRIA STIPULACEA, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 164. A shrub, 1 to 2 feet high, all parts except the inflorescence glabrous; stems as thick as a goose-quill, brown when dry. Leaves membranous, broadly oblanceolate to elliptic, or oblong, abruptly and shortly acuminate, much narrowed to the base; both surfaces glabrous, when dry brown with a reddish tinge; midrib very stout, mainnerves 11 to 13 pairs, spreading, slightly curved, distinct on both surfaces; length 5 to 9 in.; breadth 2 to 4 in.; petioles 5 to 1.25 in. long, winged near the apex. Stipules large, sub-persistent, ovate, sometimes bifid, '75 to 1 in. long, and about '4 in. broad. Cyme usually solitary, corymbose, trichotomous, terminal, on a short peduncle, bracteate at the base, about 2 to 3 in. in diam.; its branches puberulous, bracts and bracteoles triangular. Flowers 15 in. long, on short pedicels, clustered in dense, cymose, capituliform cymes at the ends of the ultimate branches. Calyx campanulate, with 5 broad pubescent lobes, the tube glabrous. Corolla longer than the calvx, widely campanulate, 4- or 5-toothed. Fruit ellipsoid, sub-compressed, 10-ridged, crowned by the small calyx, ·3 in. long, and ·15 in. in diam. Seed dorsally 5-ridged, ventrally concave, with one central ridge. Wall. Cat. 8329; DC. Prod. IV. 519; Hook, fil. Fl. Br. Ind. III. 167.

Penang: Wallich 8329; Curtis 732. Trang: Kunstler 1382.

Pahang: Ridley 2216. Perak: Ridley 2918; King's Collector, 1357, 1382; Wray 3440; Scortechini 278, 307, 558, 692.—Distrib. Sumatra.

24. PSYCHOTRIA CURTISII, n. sp., King & Gamble. A shrub, 6 feet high; young branches thinner than a goose-quill, rusty-pubescent. Leaves elliptic, sometimes somewhat obovate, tapering equally to each end, shortly acuminate, the base cuneate; both surfaces olivaceous-brown when dry, the upper glabrous or with a few hairs on the midrib near the base, the lower rusty-puberulous between the 9 or 10 pairs of bold, shortly and densely rusty-pubescent curved ascending main-nerves; length 5 to 8 in.; breadth 1.5 to 3 in.; petioles .5 in., densely rusty-pubescent. Stipules caducous. Cyme solitary, terminal, 3-branched, on a pubescent peduncle from 3 to 5 in. long (much longer in fruit), branches bearing 3 to 5 sessile flowers in capitula at their apices; bracteoles linear. Flowers 25 in. long, rusty-pubescent. Calyx half-superior, campanulate, the mouth with 5 long, spreading, ovate-acuminate lobes. Corolla longer than the calyx, salver-shaped, with 5 oblong lobes. Fruit ovoid, tapering to the apex, crowned by the long lobes of the calyx, the sides puberulous, 10-ridged. with 4 ridges on the dorsal surface, the ventral plane.

Penang: Curtis 2695.

25. PSYCHOTRIA RHINOCEBOTIS, Reinw. ex Blume Bijdr. 961. A shrub; young branches thinner than a goose-quill, at first rusty-tomentose, afterwards glabrescent and pale brown. Leaves coriaceous, obovate-oblong or obovate-oblanceolate, the apex broad, but usually with a small abrupt apiculus, the base cuneate; upper surface olivaceous, glabrous, the lower brown and softly and finely rusty-pubescent; the midrib broad, more prominent on the upper than on the lower surface; main-nerves 10 to 14 pairs, slightly curved, oblique, distinct on both surfaces; length 3 to 5 in.; breadth 1.35 to 2.5 in.; petiole 2 to 6 in., stout. Panicle solitary, terminal, 1.5 in. long and slightly wider; branches few, lax, divaricate, cymosely few-flowered. Fruit ellipticovoid, slightly compressed, with 10 vertical grooves (2 of them double), crowned by the rather broad, bluntly 5-toothed calyx, acutely 10-ridged (2 ridges double), pubescent between the ridges; length 25 in.; breadth 2 in. Seeds dorsally 4-ridged, ventral surface plane. Miq. Fl. Ind. Bat. III. 292; DC. Prod. IV. 521; Korth. Kruidk. p. 242.

PERAK: King's Collector 8272; Scortechini.

26. PSYCHOTRIA MALAYANA, Jack in Mal. Misc. I. 3; reprinted in Calc. Journ. Nat. Hist. IV. (1843), p. 26. A shrub; young branches

rather thinner than a goose-quill, sub-terete, glabrous, rather pale brown when dry. Leaves coriaceous, elliptic or broadly elliptic-lanceolate, shortly and abruptly acuminate, much narrowed to the base: upper surfaces glabrous, brown, shining when dry, the lower dull and sparsely pubescent, often tinged reddish, the edges slightly recurved: main-nerves 12 to 18 pairs, ascending, little curved, bold on the lower surface and faint on the upper; length 5 to 10 in.; breadth 2.5 to 4.5 in.; petioles 4 to 1.5 in. Stipules broadly ovate, blunt, about ·35 in. long. Cyme terminal, on an angled, sub-compressed peduncle 5 to 1 in, long (lengthening in fruit), the branches corymbose, whorled, many-flowered; ultimate cymules 3-flowered. Flowers 5 in. long. 2 on each cymule, on short pedicels (the middle one sessile), minutely bracteolate at the base. Calyx under 1 in. long, tubular, the truncate mouth minutely 5-toothed. Corolla tubular, 4 in, long, with 5 oblong sub-acute lobes; the throat villous inside. Fruit 4 in. long and 3 in. in diam., elliptic-ovoid, vertically 10-ridged, the apex with very slight remains of the calyx. Seeds faintly 4-ridged on the dorsal, the ventral surface plane with a faint central groove. DC. Prod. IV. 520. P. aurantiaca, Wall. in Roxb. Fl. Ind., ed. Carey & Wall., II. 165; Blume Bijdr. 962; Wall. Cat. 8335. Grumelia aurantiaca and Chasalia expansa, Mig. Fl. Ind. Bat. II. 296 and 281.

SINGAPORE: Ridley 6468, 8422; Hullett 904. PAHANG: Ridley 2197. Perak: King's Collector 6327, 7168; Wray 2956; Scortechini 307.—DISTRIB. Borneo, Java.

The corolla of this is larger than that of any other Malayan species of *Psychotria*, being about 4 in. long when dry.

SPECIES IMPERFECTLY KNOWN.

27. PSYCHOTRIA WRAYI, n. sp., King & Gamble. A small shrub, glabrous except the inflorescence; young branches as thick as a swan's-quill, terete, dark-coloured when dry. Leaves coriaceous, oblanceolate-elliptic, shortly acuminate, gradually narrowed from about the middle to the short, partially winged petiole; both surfaces dark olivaceous-brown when dry, the midrib rather prominent; main-nerves 13 to 15 pairs, oblique, almost straight, thin but pale and rather distinct on the lower surface, indistinct on the upper; length 6 or 7 in.; breadth 2 to 2.5 in.; petiole about .5 in., winged above. Stipules broadly ovate, sub-acute, the edges coarsely ciliate, .5 in. long. Cymes terminal, on short peduncles, bracteate at the base, umbelliform, widely spreading, about 4 in. broad and only half as long; the branches 4-angled, sub-compressed, pubescent, divergent. Flowers crowded at the extremities of the branchlets, .25 in. long, on short thick pedicels. Calyx deeply

cupular, with 5 broad, shallow blunt teeth. Corolla much longer than the calyx, widely tubular; lobes 5, blunt, broadly ovate, reflexed, the throat with a little short hair. Anthers 5, narrowly elliptic, blunt, on short filaments, almost basifixed, exserted by the reflexion of the lobes of the corolla. Fruit unknown.

PERAK: Wray 3959; King's Collector 2755.

28. PSYCHOTRIA INEQUALIS, n. sp., King & Gamble. A small unbranched shrub; the stem thinner than a goose-quill, deciduously puberulous, only a foot high, brown when dry. Leaves thickly membranous, those of a pair somewhat unequal in size, elongate-obovate, the smaller one oblong-elliptic, all abruptly and shortly acuminate, the base cuneate; upper surface glabrous, minutely pitted when dry; the lower with many coarse pale-brown, crisped, flattened hairs on the midrib and nerves, and a few pale appressed hairs on the interspaces; midrib broad and channelled on both surfaces, as are also the 10 to 13 pairs of pale ascending, slightly curved main-nerves; length 6 to 10 in.; breadth 2.5 to 5 in.; petiole .5 to .75 in., stout. Stipules narrowly ovate, acuminate, pubescent, 65 in. long. Cyme solitary, terminal, 2 to 3.5 in. long (including the 1 to 2 in. peduncle), pyramidal, everywhere rusty-puberulous, the branches opposite, many-flowered, and with broad abruptly acuminate bracts; the lowest pair exceeding 1 in. in length, reflexed; branchlets divaricate. Flowers 1 in. long, on short stout pedicels. Calyx small, tubular; its lobes broadly triangular. Corolla not much longer than the calvx, its lobes linear with moniliform bluish hairs at their bases and on the throat. Fruit unknown.

Perak: Scortechini 279.

29. PSYCHOTRIA CONDENSA, n. sp., King & Gamble. A small woody shrub; young branches half as thick as a goose-quill, the nodes close together and slightly thickened, the internodes striate, at first scurfy-puberulous but afterwards glabrous. Leaves coriaceous, narrowly elliptic or elliptic-lanceolate, shortly acuminate, the base cuneate; upper surface when dry very dark brown, the lower paler and tinged with olivaceous, the midrib prominent and pale; the 5 or 6 pairs of oblique main-nerves visible beneath but not above; length 1 to 1·25 in.; breadth ·3 to ·5 in.; petiole ·05 in. Stipules broadly triangular, acuminate, nearly ·1 in. long. Umbel cymose, 3-branched, terminal, shorter than the leaves; each branch with 3 unequally pedicillate flowers. Flowers not seen. Fruit globular-ovoid, with 2 prominent furrowed vertical ridges and several obscure ones between them, crowned by the 5-toothed calyx; length ·2 in.; breadth ·15 in. Seeds with one prominent dorsal ridge, ventral surface flat.

PERAK: Scortechini.

Order LX. VALERIANEÆ.

Herbaceous (as regards the Indo-Malayan species). Leaves opposite, exstipulate, their bases often connected by an interpetiolar line or ridge; entire, pinnatifid or pinnate. Flowers sessile, in cymes, usually hermaphrodite but sometimes polygamous or directous, bracteate. Calyx-tube adnate to the ovary, the limb in the flower small, in the fruit often enlarged or pappose. Corolla superior, gamopetalous, its tube cylindric or gibbous or spurred at the base; the limb with 3 to 5 imbricate lobes, often irregular. Stamens 1 to 4, on the tube, usually exserted. Ovary inferior with a single perfect, 1-ovuled cell, and 2 barren empty cells: style filiform: stigma 2- or 3-lobed or entire: ovule in the fertile cell pendulous from the apex of the loculus. Fruit indehiscent, dry, 1-seeded, the 2 barren cells enlarged or represented by narrow ridges. Seed pendulous, with very little or no albumen; embryo straight, radicle superior.—DISTRIB. About 350 species, in temperate climates; generally diffused, but absent from Australia and South Africa.

VALERIANA, Linn.

Perennial herbs. Leaves entire, pinnatifid or pinnate, the radical often undivided and with long petioles. Flowers in cymes, corymbosely paniculate; bracts small, oblong or linear, free or nearly so, persistent. Calyx-limb in flower obsolete, in fruit developing into a ring of from 5 to 15 feathery bristles, united at their bases into a short funnel-shaped tube. Corolla-tube funnel-shaped, its base often sub-gibbous; limb with 5 spreading lobes, both tube and limb pink or white. Stamens 3. Ovary 3-celled, only 1 cell containing 1 ovule; stigma sub-entire or shortly 3-fid. Fruit oblong, plano-convex, with 6 ribs, 1-celled; the 2 barren cells obsolete, crowned by the persistent pappose calyx.—DISTRIB. About 180 species in moist temperate regions.

Valeriana Hardwickii, Wall. in Roxb. Fl. Ind., ed. Carey & Wall. I. 166. Root fibrous. Stem erect, 1 to 3 feet high, pubescent below, mostly glabrous upwards but pilose or barbate at the nodes. Radical leaves ovate, acute, on long petioles; stem leaves unequally pinnatifid, the segments 3 to 5, the upper the longest, all lanceolate or ovate-lanceolate and irregularly toothed. Panicles lax, often as much as a foot long, the branches dichotomous, with small subulate bracteoles at the forks; fruit hairy. Wall. Cat. 432, Pl. As. Rar. 39, t. 263; Don Prod. Fl. Nep. 159; DC. Prod. IV. 640; Clarke in Hook. fil. Fl. Br. Ind. III. 213. V. Hardwickiana, Roem. & Schult., Syst. I., Mant. 259. V. tenera, Wall. Cat. 435; DC. Mem. Valer. 16; Prod. IV. 640.

V. elata, Don Prodr. 159. V. javanica, Blume Bijdr. 919. V. acuminata, Royle Ill. Him. Bot. 241.

At high elevations on the central ridge in Perak, this is said to occur, but I have seen no specimens.

Order LXI. COMPOSITÆ.

Herbs or shrubs, sometimes scandent, rarely trees. Leaves alternate, rarely opposite or whorled; simple or sometimes compound exstipulate. Florets numerous, small, aggregated in centripetal heads, sessile on the dilated top of the peduncle (receptacle); the heads surrounded by an involucre of 1- or more-seriate, free or connate bracts; bracteoles none or reduced to paleate scales or bristles on the receptacle; individual florets all tubular (head discoid), or the outer or all ligulate (head rayed); all bi-sexual or the inner bi-sexual or male, the outer female or neuter; sometimes diœcious. Sepals connate in a calyx-tube, adnate to the ovary; limb none, or composed of hairs (pappus) or scales. Petals connate in a corolla of two forms: (a) tubular or campanulate, with 4-5-lobed limb; lobes valvate with marginal nerves; (b) ligulate with lobes elongated and connate in a strapshaped or elliptic ligule. Disk epigynous. Stamens 4-5, inserted within the corolla-tube; filaments usually free; anthers basifixed, usually connate (syngenesious); connective produced upwards; cells simple or tailed at the base; pollen sub-globose, rough. Pistil an inferior 1-celled ovary; ovule solitary, basal, erect, anatropous, nucleus with one coat; style slender, normally 2-fid; the arms (sometimes) connate, linear or sub-terete, naked or pubescent externally or tipped by pubescent cones; the margins stigmatic. Fruit a dry indehiscent achene (cypsela). Seed erect; testa membranous; albumen none; embryo straight; cotyledons plano-convex; radicle short.—Distrib. Universal; genera about 1,000; species about 8,000.

Corollas of all the florets either tubular to near the mouth or the marginal row ligulate; style-arms long, distinct, or very short, or the style sub-entire in the sterile florets of heads with heterogamous florets; stems sometimes woody; leaves alternate or opposite; sap never milky:—

Florets red, purple, or white, never yellow; all similar (homogamous) and tubular, or rarely (*Elephantopus*) cleft laterally; involucre of bracts always more than 1-seriate; pappus present, usually setaceous, receptacle naked, or rarely (*Ageratum*) paleaceous:—

Anthers cleft at the base and appendiculate at the apex; style-arms subulate, hairy; leaves alternate (Vernonieæ):—

Heads distinct, many-flowered; pappus long, copious, cypselas ribbed ... 1, Vernonia.

Heads 1- or few-flowered, crowded into dense clusters		
resembling single heads; pappus chaffy	2.	ELEPHANTOPUS.
Anthers sub-entire at the base, either truncate or appendicu-		
late at the apex; leaves opposite at any rate below		
(Eupatoriex): -		
Anthers truncate at the apex	3.	ADENOSTEMMA.
Anthers appendiculate at the apex:—		
Pappus paleaceous, receptacle sometimes paleaceous	4.	AGERATUM.
Pappus of slender hairs; receptacle always naked;		
bracts of involucre 4 with sometimes a small outer		
one; scandent	5.	MIKANIA.
Florets, if homogamous and tubular, yellow; if heterogamous,		
at least those of the disk yellow; or if none of the florets		
yellow (Emilia) then with the bracts of the involucre 1-seriate		
Anthers appendiculate at the apex (Asteroideæ):—		
Receptacle naked, smooth, or pitted; sometimes, when		
pitted, the edge of the pit fimbriate:-		
Bracts of involucre in two rows:—		
Anthers sub-entire at the base; florets all tubular,		
those of the disk purple, of the ray filiform, yellowish		
or white; pappus none or of 2 bristles; heads small		
in lax panicled cymes, bracts of involucre in two		
series; erect herbs	6.	DICHROCEPHALA.
Bracts of the involucre many-seriate, leaves alter-		
nate:—		
Anthers obtuse and entire at the base; florets of disk		
tubular with wide limb; those of the ray filiform-		
tubular or tubular only at the base, expanding into		
small yellowish ligules; pappus copious and silky;		
heads in dense corymbose panicles; climbers	7.	Microglossa.
Anthers cleft at the base; style-arms of hermaphro-		
dite flower filiform, linear, or obtuse, or those of the		
sterile flowers undivided (Inuloideæ):—		
Flower-heads medium-sized; separate, solitary, or		
in corymbose or paniculate cymes, not in globose		
clusters, if clustered the cypselas with copious soft		
pappus :—		
Herbs; bracts of involucre narrow; flowers not		
corymbose:—		
Anther-cells tailed at the base, the tails of		
adjacent anthers confluent	8.	BLUMEA.
Anther-cells sagittate at the base, not tailed		
or connate	9.	LAGGERA.
Shrubs; bracts of involucre broad; flowers		
corymbose	10.	PLUCHEA.
Flower-heads small, clustered in dense ovoid or		
globose masses; herbs with winged stems; pappus		 A Substitute A TEST British
	11.	SPHERANTHUS.
교육을 잃고 하는 것이다. 국가는 영화를 가지 않아 있다면 가장이 가지 않는 것이 없었다. 그는 사람들은 그리고 있다고 있다고 있다면 가장이 없었다.	11.	SPHÆRANTHUS.

(calyculus) at their bases; heads homogamous; anthercells sub-entire at the base; receptacle naked (Senecionida):-Leaves alternate: pappus of fine hairs, style-arms of hermaphrodite flowers truncate or obtuse, penicillate or with a hairy tip :-.. 12. EMILIA. Heads ebracteate; florets purple .. 13. GYNURA. Heads bracteolate; florets yellow Receptacles paleaceous; anthers sub-entire at the base; bracts of involucre 1- to many-seriate; heads usually radiate, heterogamous; style-arms truncate or appendiculate, or those of the sterile florets entire; pappus of 2 to 4 arms or paleaceous or absent; leaves at the base of the stem usually opposite, those higher up opposite or alternate (Helianthoideæ) :--Pappus of only 4 bristly awns, or cup-like or absent:-Cypselas all thick, or those of the ray-florets 3-angled and those of the disc laterally compressed; pappus cup-like or composed of 2 to 3 stiff chaffy or bristly arms, with or without intermediate smaller scales or altogether absent; leaves usually opposite:-Inner bracts of the involucre embracing and enclosing the cypselas of the fertile ray-florets; pappus absent, outer bracts of involucre 5, glandular .. 14. Siegesbeckia. Inner bracts of the involucre all flat, scales of receptacle flat, very narrow, usually few; diskflorets 4-5-fid, ligules small; pappus absent, or if present shortly 2-awned; outer bracts of involucre numerous .. 15. ECLIPTA. Scales of the receptacle concave or complicated more or less enclosing and embracing the disk Cypselas not winged, compressed or 3-5-angled. ray-florets yellow with large ligules; disk-cypselas with 1 or 2 short deciduous awns: leaves all opposite 16. WEDELIA. Cypselas of the disk-florets ciliate, winged on the margins, laterally compressed; heads small; leaves always opposite 17. SPILANTHES. Cypselas more or less depressed from the top; pappus of 2 (rarely 3 or 4) bristles or absent :-Outer bracts of the involucre almost equal; herbaceous; inner bracts separate, almost resembling the scales of the receptacle; ray-florets fertile; leaves opposite:-Cypselas flat, their margins lacerate and winged; pappus composed of bristles .. 18. SYNEDRELLA. Outer bracts of the involucre few, small; inner

bracts connate below, membranous:-

Cypselas not beaked; leaves opposite, simple to pinnatisect Pappus of membranous scales; heads radiate; leaves opposite:-Scales of pappus feathery, fringed; heads mediumsized 20. TRIDAX. Anthers inappendiculate at the apex; receptacle (in our species) not paleaceous; pappus absent or reduced to a raised rim, rarely scaly and short; leaves usually alternate (Anthemideæ) :--Flower-heads discoid, heterogamous; pappus absent:-Florets of the circumference very numerous; cypselas flat or concave at the top; flower-heads globose or hemispheric, sub-sessile; bracts of involucre in 2 series, 21. CENTIPEDA. spreading in fruit ... Florets of the circumference few; heads very small, in racemes or panicles; cypselas ellipsoid or obovoid, .. 22. ARTEMISIA. rounded at the apex Corollas of all the florets flatly expanded from a tubular base, ligulate, their apices 5-toothed; leaves radical or cauline and alternate, never opposite; stem always herbaceous, fistulose; sap milky (Cichorieæ) :-Pappus of simple hair-like bristles, at least in the central florets; florets yellow, cypselas fusiform or oblong, with .. 23. CREPIS. glabrous or puberulous ribs

Note.—The above key is taken mainly from "Bengal Plants," by Lieut.-Col. D. Prain, F.R.S., Superintendent, Royal Botanic Garden, Calcutta.

1. Vernonia, Schreb.

Herbs, shrubs, climbers or small trees. Leaves alternate, penninerved, entire or dentate. Heads axillary or terminal, solitary or in cymes or panicles, homogamous; flowers often few, but very rarely solitary. Involucre ovoid, globose or hemispheric, as long as or shorter than the flowers; bracts in many series, the inner longest. Receptacle naked or pitted, sometimes with short hairs. Corollas all equal, tubular, slender; lobes 5, narrow. Anther-bases obtuse, sagittate. Style-arms subulate, acute, hairy. Cypselas striate, ribbed or angled, rarely terete, truncate at the apex; pappus of many hairs, usually in two rows, the inner hairs thin and slender, the outer sometimes stout and compressed, persistent or deciduous.—Distrib. About 500 species, mostly American.

Heads few, 35 in. in diam., in long-peduncled cymes. . . 2. V. chinensis.

Heads numerous, 2 to 25 in. in diam., in loose terminal corymbose cymes 3. V. cinerea.

1. VERNONIA ARBOREA, Buch.-Ham. in Trans. Linn. Soc. XIV. 218. A tree, 30 to 60 feet high; young branches as thick as a goose-quill or thinner, at first covered, like the under surfaces of the leaves and branches of the inflorescence, with short rusty tomentum, sometimes glabrous or glabrescent. Leaves sub-coriaceous, entire, elliptic ovate or ovate-oblong, acute or shortly acuminate, the base rounded or cuneate; upper surface glabrous, or nearly so, except the midrib, the reticulations minute and distinct: main-nerves 8 to 14 pairs, spreading, interarching, bold and distinct on the lower surface, more faint on the upper; length 3.5 to 6 in.; breadth 1.75 to 2.75 in.; petioles .75 to 1.25 in., pubescent. Heads 2- to 5-flowered, collected in large open terminal panicles much longer than the leaves. Involucral bracts few, small, oblong, obtuse, less than half as long as the flowers, pubescent, concave, persistent. Corolla glabrous, bluish. Cypselas not conspicuously ribbed, short, truncate; pappus in a single row, tuberculate, white tinged with ochraceous, persistent. DC. Prod. V. 22; Kurz For. Fl. Burm. II. 80; Clarke Comp. Ind. 23; Hook, fil. Fl. Br. Ind. III. 239. javanica, Blumeana and celebica, DC. l.c. 21, 22; Miq. Fl. Ind. Bat. II. 9, 10. Eupatorium celebicum and javanicum, Blume Bijdr. 903. Conyza acuminata and arborea, Wall. Cat. 3034A and 3074.

Malacca: Griffith. Singapore: Lobb; Ridley 2735, 2739, 9478; Maingay (K.D.) 948, 949, 950. Penang: Curtis 2, 926. Negri Sembilan: Ridley 10087. Selangor: Ridley. Perak: Wray 2240, 2442; King's Collector, many Numbers; Scortechini.—Distrib. Ceylon, Malay Archipelago, Philippines, China.

2. Vernonia chinensis, Less. in Linnæa, VI. 674. An erect annual with divaricate, softly puberulous to tomentose, angled branches. Leaves alternate, sessile or petiolate, membranous, ovate elliptic elliptic-lanceolate or oblanceolate, narrowed at the base, sub-serrate or entire. Heads few, '35 in. in diam., in lax, few-branched, axillary and terminal, open puberulous cymes, on slender peduncles longer than the leaves, 15- to 30-flowered. Involucral bracts not numerous, lanceolate, awned or acute, usually at first pubescent outside, inside glabrous, shining, 1-nerved; longer than the glabrous or glabrescent corollas. Cypselas less than 1 in. long, 4- or 5-ribbed, glabrous. Pappus scanty, white. Clarke Comp. Ind. 78; Hook. fil. Fl. Br. Ind. III. 235. V. albicans, DC. in Wight Contrib. 6; Prod. V. 26 (in part). Cyanopis pubescens and C. villosa, DC. Prod. V. 69. Conyza chinensis, Lamk. Diet. II. 83 (not of Linn.). C. punctulata, Wall. Cat. 2995. Eupatorium menthæfolium, Wall. Cat. Cynanthillium villosum and C. pubescens, Blume

Bijdr. 889 and 890. Centratherum chinense, Less. in Linnæa (1829) 320. Synanthera, Wall. Cat. 7136.

Penang: J. Scott; Curtis 931; King; Deschamps; Malacca: Cuming; Griffith; Hullett 634. Singapore: King.—Distrib. Malay Archipelago, Philippines.

3. VERNONIA CINEREA, Less. in Linnæa, IV. 291, and VI. 673. Herbaceous, erect, 6 to 18 in. high, with more or less minute whitish pubescence everywhere; stems slender, striate. Leaves membranous with variable petioles, ovate or lanceolate, sometimes oboyate or oblanceolate, the apex obtuse or acute, the edges obtusely or acutely toothed, the base narrowed, both surfaces olivaceous-cinereous when dry, the upper glabrous or nearly so, the lower more or less cinereous-pubescent; length 1.5 to 3 in.; breadth .3 to .5 in.; petiole .1 to .5 in. (in the lower leaves). Heads 2 to 25 in. in diam., on 10- to 20-flowered, loose, terminal, long-peduncled, corymbose cymes with divaricate branches; bracts of peduncle very few. Involucral scales linear-lanceolate, acuminate or almost awned, shorter than the florets, 1-nerved, ·1 in. long, densely pubescent. Corolla pubescent, the tube very narrow lavender. Cypselas minute; pappus copious, dirty white, the outer row very short. DC. Prod. V. 24, in Wight Contrib. 6; Wall. Cat. 3008; Hook, fil. Fl. Br. Ind. III. 234; Mig. Fl. Ind. Bat. II. 11; Prain Bengal Plants, 590. V. conyzoides, DC. in Wight Contrib. 6; Prod. V. 25. V. rhomboidea and V. montana, Edgew. in Trans. Linn. Soc. XX. 62. V. albicans, DC. in Wight Contrib. 6 (in part); Wight Ic. 1076. V. abbreviata and leptophylla, DC. l.c. 25. V. laxiflora, Less. in Linnæa, VI. 646; DC. 1.c. 25. V. physalifolia, DC. in Wight Contrib. 6; Prod. Fl. Pen. Ind. Or. 24. V. parviflora, linifolia, and fasciculata, Reinw. in Bl. Bijdr. 893. V. Zollingeriana, Schultz-Bip. in Miq. Fl. Ind. Bat. II. 16. V. cyanonioides, Walp. in Linnæa XIV. 509. Conyza abbreviata, Wall. Cat. 3048; C. bellidifolia, id. 3047; cinerascens, 3062; incana, 3046; linifolia, 3063; elegantula, 3049; ovata, 3097, and sub-simplex, 3003. C. cinerea, Linn. Sp. Pl. 862; Wall. Cat. 3008. C. prolifera and C. heterophylla, Lam. Encyl. II. 84. Serratula cinerea, Roxb. Hort. Beng. 60. Chrysocoma purpurea, Forst. Prod. 54. C. violacea, Schum. Pl. Guin. 384. Cyanopis decurrens, Zoll.

In all the provinces, in waste places near cultivation.—DISTRIB. All tropical countries.

2. Elephantopus, Linn.

Perennial rigid herbs. Leaves alternate, sessile, penninerved, entire or dentate, mostly radical. Heads homogamous, each containing 1 to 5

flowers, and collected into ovoid or globose clusters, surrounded by several large leafy bracts. Involucre-proper compressed, its component bracts oblong, acute, about 8, dry, stiff, unequal, alternately flat and conduplicate; receptacle naked. Flowers all equally 4-lobed, and cleft on one side, and with the lobes spreading in a somewhat palmate manner. Anthers obtusely sagittate at the base. Style-arms subulate. Cypselas truncate, 10-ribbed; bristles of pappus few, rigid, shining, slender and dilated below or chaffy.—Distrib. 10 or 12 species, chiefly tropical American—one cosmopolitan.

ELEPHANTOPUS SCABER, Linn. Sp. Pl., 814. Stems dichotomous, from a few inches to 2 feet high, terete, finely strigose. membranous, the radical ones obovate, oblong to elliptic-oblong, tapering to the short petiole, the edges dentate or crenate, up to 6 in. in length and 1.25 to 2.5 in. broad; the cauline few, smaller, sessile, both sets scabrid on the upper surface and finely strigose on the lower; main-nerves 6 to 8 pairs in the cauline, more numerous in the radical leaves, all slightly prominent on the lower surface. Collective heads hemispheric, 5 to 75 in. in diam., solitary, terminal, on long peduncles. Bracts of the conjoined heads 3, leaf-like, about 5 in. broad, broadly ovate or reniform, apiculate, nervose and pubescent behind; bracts of the involucre-proper shining, glabrous; pappus of 5 shining tuberculate bristles, dilated at the base. Wall. Cat. 2979; DC. Prod. V. 86; Roxb. Fl. Ind. III. 445; Don Prod. 169; Wight Ic. 1086; Clarke Comp. Ind. 28; Hook, fil. Fl. Br. Ind. III. 242; Prain Bengal Plants, 590.

In all the provinces, in cultivated places.—DISTRIB. In most tropical countries.

3. Adenostemma, Forst.

Herbs, glandular-pubescent or glabrous. Leaves mostly opposite, petiolate. Heads homogamous, in lax corymbose cymes; involucre campanulate; its bracts numerous, sub-2-seriate, narrow, herbaceous, sometimes connate; receptacle flat, naked. Corollas all equal, tubular, regular, with short tube and campanulate 5-toothed limb. Anthers truncate, with glandular apiculus, their bases obtuse. Style-arms elongate, dilated near the apex. Cypselas obtuse, 5-ribbed, glandular; pappus of 3 to 5 short rigid, often clavate hairs, joined at their bases by a narrow ring.—Distrib. Species 5 or 6 American, 1 cosmopolitan.

ADENOSTEMMA VISCOSUM, Forst. Char. Gen. 20. An erect, rarely decumbent annual, slender or robust, glabrous; pubescent or viscidly pubescent. Leaves membranous, sessile or petiolate, opposite or the upper alternate, from linear to broadly ovate, acute sub-acute cuneate or cordate at the base, the edges serrate crenate or entire, the upper surface usually smooth but sometimes rugose; length from 2 to 6 in.;

petioles varying in length. Heads 3 to 4 in. in diam., in lax corymbose, pedunculate cymes. Involucral bracts oblong, obtuse or acute, glabrous, glandular or scabrid. Corollas white, pubescent near the mouth, styles much exserted, the arms clavate. Cypselas usually warted, crowned by a glandular ring, bearing pedicellate lobed glands. DC. Prod. V. 111; Clarke Comp. Ind. 28; Hook. fil. Fl. Br. Ind. III. 242; Prain Bengal Plants, 591.

In all the provinces, but not abundant in any of them.—DISTRIB. The tropics generally.

In the Flora of British India, III. 242, Sir Joseph Hooker recognises seven varieties of this widely distributed and variable species. And to one or other of these he reduces the following eleven species of De Candolle: A. fastigiatum, DC. Prod. V. 111, A. leiocarpum, A. Roylei, A. elatum, A. latifolium, l.c. p. 112, A. macrophyllum, A. parviflorum, A. reticulatum, A. viscosum, A. madurense, A. erectum, l.c. p. 113. He also reduces here the following: Ageratum aquaticum, Roxb. Fl. Ind. III. 415; A. strictum, Bot. Mag. t. 2410; Lavenia fastigiata, macrophylla and parviflora, Blume Bijdr. pp. 905 and 906; and the following Nos. of the Wallichian Catalogue, viz., Lavenia erecta, 3218; carnosa, 3219; alba, 3220; rugosa, 3221; viscida, 3222.

4. AGERATUM, Linn.

Erect herbs. Leaves opposite in the lower part of the stem, alternate in the upper. Heads in panicles or corymbs, homogamous. Involucre narrowly campanulate; its bracts in 2 or 3 series, linear, subequal; receptacle convex, naked or with deciduous scales. Corollas all tubular, equal, regular, the limb 5-cleft. Anthers with slight apical appendages, their bases obtuse. Style-arms elongate, obtuse. Cypselas 5-angled; pappus of 5 short, free or connate scales, or of 10 to 20 narrow, unequal scales.—Distrib. About 20 species, all probably American, several introduced in the Tropics of the Old World.

AGERATUM CONYZOIDES, Linn. Sp. Pl. 839. Annual, 1 to 2 feet high, everywhere with sparse white, rather soft pubescence. Leaves membranous, ovate, sub-acute, the base broad and sub-truncate, sometimes cuneate; the edges coarsely crenate or dentate; both surfaces greenish when dry, the upper sparsely hispid; the lower glabrous, boldly reticulate; main-nerves about 2 or 3 pairs, ascending, curved, the lower one branching; length 1 to 3.5 in. Heads .25 in. in diam., in terminal or axillary corymbose cymes. Involucral bracts shorter than the flowers, narrowly lanceolate, acute, 3-nerved, puberulous. Corollas pale blue or white. Cypselas black; pappus of 5 shining, spreading scales, with broad, often serrate bases. DC. Prod. V. 108; Clarke Comp. Ind. 30; Wall. Cat. 3176; Hook. fil. Fl. Br. Ind. III. 243; Prain Bengal Plants, 591. A. cordifolium, Roxb. Fl. Ind. III. 415; Wall. Cat. 3177.

In all the provinces, in cultivated places.—DISTRIB. The tropics generally.

5. MIKANIA, Willd.

A twining herb (in Indo-Malaya). Leaves opposite, petiolate. Heads small, in spikes racemes or panicles, homogamous, usually 4-flowered. Involucre oblong, its bracts 4, narrow, sometimes with a small outer one; receptacle small, naked. Corollas all equal, regular, tubular, the tube narrow; the limb campanulate, 5-fid. Anthers appendiculate, the base obtuse. Style-arms long, acute. Cypselas with truncate apices, 5-angled; pappus with one or more rows of scabrid hairs, often connate at the base.—Distrib. About 60 species, all in the warm parts of America and Africa except the following.

Mikania scandens, Willd. Sp. Pl. 1743. A glabrous or puberulous climber; young branches less than half as thick as a goose-quill, brown and striate when dry. Leaves membranous, on long petioles, ovate, acuminate; the base broad, cordate, often almost sagittate, the edges sinuate; main-nerves a single pair, ascending from the base and branching outwards; length 1 to 2 in.; breadth 6 to 1.25 in.; petioles 5 to 1 in., slender. Heads narrow, 4-flowered, in lax corymbose cymes, on slender peduncles much longer than the leaves, peduncles and branches angled when dry, puberulous. Scales of involucre chaffy, narrowly oblong, obtuse. Cypselas glabrous; pappus reddish. DC. Prod. V. 199; Clarke Comp. Ind. 34; Hook. fil. Fl. Br. Ind. III. 244; Prain Bengal Plants, 592. M. volubilis and M. chenopodifolia, Willd. l.c. 1745; DC. l.c. 199 and 201. Eupatorium scandens, Linn.; Jacq. Ic. t. 169.

In all the provinces, common.—DISTRIB. British India, Malay Archipelago, Tropical Africa.

6. DICHROCEPHALA, DC.

Annuals, with alternate toothed lyrate or pinnatifid leaves. Heads small, heterogamous, globose or hemispheric, not rayed, in panieles; Outer florets 2, in many rows, slender, fertile, rigid, 2-3-toothed or cleft. Disk-florets 3, fertile, narrow, 4- or 5-toothed. Anthers with truncate bases. Style-arms of 3 florets short, flattened, the tips lanceolate; pappus none or (in the 3) of 2 minute bristles.—DISTRIB. Species 5, Asiatic and African.

DICHROCEPHALA LATIFOLIA, DC. in Guill. Archiv. Bot. II. 518. An annual weed, 12 to 24 in. high, erect or spreading, glabrous pubescent or villous. Leaves very variable, ovate lanceolate or obovate, entire pinnatifid or lyrate, with the terminal lobe broadly ovate and coarsely

toothed; length 1 to 4 in.; petioles ·25 to 1·25 in. Heads about ·15 in. in diam., globose, on pedicels many times longer than themselves, in lax, few-branched, cymose panicles. Ray-florets · , filiform, obscurely 2-3-toothed, white. Disk-florets · , 4-cleft, yellow. Cypselas very small, smooth, with a callous margin, and often with 2 small bristles. DC. in Wight Contrib. 11, Prod. V. 372; Wight Ic. 1096; Clarke Comp. Ind. 36; Hook. fil. Fl. Br. Ind. III. 245. D. gracilis and D. sonchifolia, DC. 1.c. 371, 372. Cotula sinapifolia, Roxb. Hort. Beng. 63, Fl. Ind. III. 437; Wall. Cat. 3237. C. bicolor, Roth Cat. Bot. II. 116. C. latifolia, Pers. Syn. II. 464. Grangea latifolia, Lam. Ill. t. 699. Hippia bicolor, Smith in Rees Cyclop. XVIII. Ethulia integrifolia, Don Prodr. 182.

Perak: Scortechini.—Distrib. British India, tropical and subtropical Asia and Africa.

7. MICROGLOSSA, DC.

Slender shrubs, often scandent. Leaves alternate, entire. Heads small, heterogamous, collected in large corymbose panicles. Ray-florets \S , in 1 or more series, fertile, the ligule minute, white. Disk-florets few or many, \S , fertile, tubular, with dilated 3- to 4-fid limb. Involucre campanulate, composed of several series of narrow bracts, the outer shorter. Receptacle flat, naked or nearly so. Corolla, the ligulate or ray ones narrow, about as long as the style; those of the disk (the tubular) longer. Anthers with obtuse bases, entire. Style-arms of the flattened; their tips long, lanceolate. Cypselas angled; pappus hairs numerous, slender, silky, in one or two series, somewhat unequal.—DISTRIB. About 6 species, Asiatic and African.

Microglossa volubilis, DC. Prod. V. 320. A sub-scandent shrub; branches half as thick as a goose-quill, ridged, glabrous. Leaves membranous, ovate-lanceolate, acuminate, the base cuneate or rounded, the edges obscurely toothed; both surfaces brown when dry, glabrous, the lower sometimes slightly pubescent; main-nerves 4 or 5 pairs, little curved, ascending, prominent beneath; length 1.5 to 2 in.; breadth .65 to 1.25 in.; petioles .25 to .4 in., slender. Heads .35 in. in diam., on short peduncles, crowded in dense corymbose terminal cymes, much longer than the leaves. Cypselas compressed, 4-angled, puberulous; pappus copious, reddish, much longer than the minute achenes. Clarke Comp. Ind. 57; Kurz For. Fl. Burm. II. 82; Hook. fil. Fl. Br. Ind. III. 257. Conyza volubilis, Wall. Cat. 3057. Erigeron pyrifolius, Benth. Fl. Hongk., 176.

PERAK: Ridley 2890; Wray 2472. PENANG: Wallich 3057.

—DISTRIB. British India, Burma, Malay Archipelago, China.

8. BLUMEA, DC.

Herbs, annual or perennial, glandular-pubescent or woolly. Leaves alternate, rarely entire, usually lobed or toothed. Heads in paniculate cymes, rarely in racemes, heterogamous, disciform, yellow or purplish. Ray-florets in several series, 9, fertile, filiform, 2- or 3toothed. Disk-florets &, few, fertile, with slender tube and 5-toothed Involucre ovoid or campanulate; its bracts in several rows, narrow, acute, herbaceous, the outer smaller; receptacle flat, naked. Anthers with sagittate bases produced into small slender tails. Stylearms of the hermaphrodite flower flattened or filiform, rarely connate with the nearest anthers. Cypselas small, sub-terete or angular, with or without ridges; pappus hairs in a single row, slender, often caducous. -DISTRIB. About 60 species, in tropical and sub-tropical Asia, Africa, and Australia.

Scandent; pappus white	1. B. chinensis.
Large shrub; pappus red	2. B. balsamifera.
Erect herbs; pappus white:—	
Heads in small sessile clusters of 2 or 3 in the axils of small	
bracts on an elongated pseudo-spike	3. B. glomerata.
Heads few (1 to 6), in short, axillary, condensed, pedunculate	
cymes; leaves oblanceolate or obovate, dentate but not lobed;	
flowers purple	4. B. Wightiana.
Heads sessile or sub-sessile, in lax, shortly-branched, leafy	
cymose panicles; leaves oblanceolate, dentate but not lobed;	
flowers yellow	5. B. lacera.
Heads sessile or sub-sessile, in axillary spikes several inches	
long, arranged in a pseudo-panicle; leaves oblanceolate, den-	
tate and sometimes lobulate; flowers yellow	6. B. membranacea.

1. Blumea Chinensis, DC. Prod. V. 444. Scandent; young branches half as thick as a goose-quill, glabrous, much striate and dark brown when dry. Leaves membranous, elliptic or oblong-elliptic. acuminate or acute, narrowed to the rounded base, the edges with remote, narrow, small sharp teeth, or sub-entire; both surfaces glabrous, the upper dark-brown and shining, the lower paler and tinged olivaceous; main-nerves 4 or 5 pairs, curved, ascending, thin but distinct on the lower surface, faint on the upper; length 2.25 to 3.25 in.; breadth 85 to 14 in.; petiole 2 to 3 in. Heads 35 in. across, sessile, in small pedunculate axillary cymes, 3 in. long, diminishing upwards to ·75 in. in length; the peduncles and their branches everywhere pubescent, sometimes a small cyme with 2 to 4 heads in the same axil as a longer one. Involucral bracts of the outer two series short, ovate-lanceolate, blunt, densely pubescent, those of the inner two twice as long

(or more), linear-lanceolate, acuminate, puberulous or almost glabrous, 1-nerved, longer than the copious white pappus; corolla-lobes hairy; receptacle and cypselas silky, white. Hook fil. Fl. Br. Ind. III. 268. Conyza chinensis, Linn. Sp. Pl. 862; Blume Bijdr. 898. B. longispina, Zoll. et Morr. Syst. Verz. 121. C. serici-vestita, Wall. Cat. 2996B. Baccharis nitida, Wall. Cat. 3043.

Penang: Curtis 2824; Wallich 2996, 3043. Singapore: Ridley 2744. Perak: Scortechini 1471.

Var. riparia, King & Gamble. Young leaves and stems somewhat hairy; main-nerves of leaves 3 to 4 pairs, depressed on the upper surface. Blumea riparia, DC. Prod. V. 444; Clarke Comp. Ind. 85. Conyza riparia, Blume Bijdr. 899.

Perak: King's Collector 1214; Scortechini.—Distrib. Java, Borneo.

2. Blumea Balsamifera, DC. Prod. V. 466. A shrub, 6 to 12 feet high; young branches nearly as thick as a goose-quill, tomentose, striate. Leaves thickly membranous or sub-coriaceous, elliptic-lanceolate, coarsely and unequally serrate dentate or sub-entire, acute or sub-acute, narrowed at the base; upper surface dark olivaceous-green, minutely tomentose or strigose, the lower surface with dense silky cinereous-yellowish tomentum; main-nerves 7 to 10 pairs, curved, ascending, faint on both surfaces, but especially on the lower; length 2 to 3 in.; breadth .75 to 1.5 in.; petioles .2 to .75 in. long, the longer ones often with lateral auricles; in the lower part of the branches the leaves often much larger. Heads sub-cylindric, sessile, or on short pedicels, arranged in large, lax, and spreading or dense, often leafy, corymbose or panicled, axillary and terminal tawny-tomentose cymes. Involucral bracts linear, acuminate, densely tomentose; hermaphrodite florets very numerous in the centre, narrowly tubular; receptacle naked. Cypselas 10-ribbed, silky; pappus copious, red. Clarke Comp. Ind. 89; Kurz For. Fl. Burm. II. 82; Hook. fil. Fl. Br. Ind. III. 270; Prain Bengal Plants, 598. Conyza balsamifera, Linn. Sp. Pl. ed. II. 1208; Wall. Cat. 2998; Roxb. Fl. Ind. III. 427. C. vestita, Wall. Cat. 2998. C. appendiculata Blume Bijdr. 895 (not of Lam.).

MALACCA: Griffith (K.D.) 3143; Hervey. Penang: Walker 160; Scott; Curtis 29. Perak: Scortechini; King's Collector 6343; Wray 1741. Singapore: G. Thomson; Hullett 372; Ridley 2742. Johore: King.—Distrib. British India, Malay Archipelago.

VAR. angustifolia, King & Gamble. Leaves narrowly oblong, acute at both ends, less than 5 in. broad.

SINGAPORE: Ridley 2742.

3. Blumea Glomerata, DC. in Wight Contrib. 15. An erect

herb, about 18 to 24 in. high; stem at the base nearly as thick as a goose-quill, sparsely sub-glandular-pubescent, the hairs spreading. Leaves membranous, olivaceous, sparsely strigose on both surfaces, the hairs on the upper surface with bulbous bases; the lower sessile, lyrately lobed, the lobes dentate, the apex acute; the upper leaves much smaller, lanceolate, dentate. Heads from 2 to 25 in. in diam., in small sessile clusters of 2 or 3, all in the axils of small leaf-like bracts along the long slender branches, forming a pseudo-spike. Involucral bracts narrowly linear, pubescent, 1-nerved; receptacle glabrous. Outer florets with very slender corollas. Cypselas faintly 8-10-ribbed, glabrous; pappus in a single row, white, shining. DC. Prod. V. 443; Hook. fil. Fl. Br. Ind. III. 262. B. fasciculata, DC. l.c. 442; Clarke Comp. Ind. 81. B. fistulosa, Kurz in Journ. As. Soc. Beng. 1877, II. 187. B. holosericea, racemosa, spinellosa, gracilis, purpurea, and leptoclada, DC. l.c. 442, 443. Conyza fistulosa, Roxb. Fl. Ind. III. 429. Conyza racemosa, sericea, glomerata, gracilis, purpurea and holosericea, Wall. Cat. 3002, 3021, 3055, 3064, 3076, 3103.

Penang: Deschamps.—Distrib. British India, Malay Archipelago, China.

4. Blumea Wightiana, DC. in Wight Contrib. 14. An erect, little-branched herb, 1 to 3 feet high, covered everywhere with silky white, scanty or copious, soft, sub-adpressed hairs; stem terete, about as thick as a goose-quill at the base, striate, brown, and nearly glabrous (from the fall of the hairs) when old. Leaves diminishing in size from below upwards, thickly membranous, obovate-oblong or elliptic-obovate, the apex acute or sub-acute, gradually narrowed from about the middle to the short petiole; the edges with a few irregular coarse teeth, sometimes slightly lobed; both surfaces olivaceous-brown when dry, and clothed, but especially the lower, with adpressed, short white pubescence; main-nerves 4 or 5 pairs, curved, ascending, faint on both surfaces; length 1.25 to 3 in.; breadth .5 to 1.25 in.; petioles from 1 to 25 in. long or even more, sometimes auricled about the middle. Heads paniculate, about 3 or 4 in. across, axillary, solitary or in pairs (reduced cymes), or 4 to 6 in very short rounded axillary cymes on peduncles of varying length, but always short, the upper few inches of the stem crowded by a dense mass of cymes. Involucral bracts in several rows, diminishing in size outwards, the inner linear, somewhat longer than the pappus, all pubescent and 1-nerved; receptacle naked. Outer florets very numerous, their corollas very slender. Inner florets about 4, much wider than the outer. Cypselas small, puberulous; pappus in a single row, white. DC. Prod. V. 435; Clarke Comp. Ind. 74; Kurz in Journ. As. Soc. 1877, II. 156 (excl. syn. hymenophylla); Hook. fil. Fl. Br. Ind. III. 261. B. trichophora, parvifolia, and phyllostachya, DC. l.c. 436, 437, 438. Conyza lactucæfolia, paniculata, bifoliata, and Wightiana, Wall. Cat. 3088 (in part), 3090A, 3091, 3093. Erigeron molle, Don Prod. 172.

Penang and Singapore: By roadsides, not common.—Distrib. British India and Ceylon, Malay Archipelago, tropical Australia and Africa.

5. Blumea lacera, DC. in Wight Contrib. 14. An erect herb. 2 to 3 feet high; stems at the base nearly as thick as a goosequill, adpressed-pubescent. Leaves thickly membranous, oblanceolate obtuse or sub-acute, much narrowed to the petiole, the edges unequally and remotely dentate; both surfaces olivaceous when dry, the lower somewhat the paler and with thin, pale pubescence; the upper glabrous, sub-scabrid; length 1.5 to 2 in.; breadth .5 to 1 in.; petiole .3 to .5 in. long. Heads 3 in. across, sub-sessile or sessile, in small rounded crowded cymes, on slender ebracteate axillary peduncles, 1 to 2.5 in. long, subtended by small leaf-like bracts, and occupying the upper half of the stem. Involucral bracts linear-oblong, tomentose, about as long as the pappus; receptacle naked. Heads 4 in. across, sessile or nearly so, in a lax, shortly-branched, leafy, cymose, pubescent panicle, 12 to 18 in. long. Involucral bracts nearly uniform, linear, acuminate, 1-nerved, puberulous, as long as the pappus. Receptacle slightly convex, naked. Cypselas narrowly oblong, glabrous, not ribbed; pappus in a single row, white. DC. Prod. V. 436; Clarke Comp. Ind. 76; Hook. fil. Fl. Br. Ind. III. 263. B. Musra, DC. l.c. 435; Deless. Ic. Sel. IV. t. 23. B. villosa, Schultz-Bip. in Pl. Hohenack. n. 2a. Conyza lacera, Roxb. Fl. Ind. III. 428; Wall. Cat. 3082. C. thyrsiflora, villosa, and Musra, Ham.; Wall. Cat. sub 3082, 3083, 3095. C. lactucifolia, DC. l.c. 435; Wall. Cat. 3088 (in part); Burm. Fl. Ind. 180, t. 59, f. 1.

PERAK: Scortechini 141, 1430. SINGAPORE: Cantley; Hullett 227.

—DISTRIB. British India, Ceylon, Malay Archipelago, China, tropical Africa.

6. Blumea membranacea, DC. Prod. V. 440. A rigid erect herb, 1 to 2 feet high; stem at the base half as thick as a goose-quill, minutely pubescent from base to apex, terete, striate. Leaves thinly membranous, oblanceolate, much tapered to the base, sub-sessile, the apex acute, the edges coarsely and often irregularly dentate, sometimes lobulate; both surfaces pale olivaceous-brown when dry, the lower paler, sparsely strigose; main-nerves 7 to 9 pairs, spreading, faint on both surfaces; length 2 to 3.5 in.; breadth .8 to 1.5 in.; the leaves of the upper part of the stem smaller and bract-like. Heads .25 in. in diam., sessile or sub-sessile, in spikes several inches long, from the

axils of small leaf-like bracts, arranged in a narrow pseudo-panicle occupying the upper half of the stem. Involucral bracts linear, acuminate, pubescent, 1-nerved, as long as the inner pappus. Corollas very narrow; receptacle naked. Cypselas small, glabrous; pappus white, in two rows, the outer very short. Hook fil. Fl. Br. Ind. III. 265. B. hymenophylla, DC. l.c. 440. Conyza membranacea and hymenophylla, Wall. Cat. 3019, 3038. C. virens, Wall. Cat. 3037d. C. diffusa, Roxb. Fl. Ind. III. 429.

Penang: Curtis 2759; Deschamps.—Distrib. British India, Malay Archipelago.

9. LAGGERA, Schultz.-Bip.

Annual or perennial herbs. Leaves alternate, often rigid and decurrent. Heads panicled or axillary, heterogamous, disciform. Outer flowers 2, in several rows, fertile, filiform, the mouth minutely toothed. Disk-flowers 2, in several rows, fertile, tubular, 5-fid. Involucre campanulate; bracts many-rowed, narrow, often rigid, the outer shorter; receptacle flat, naked. Anthers 2-lobed or sagittate at the base; the auricles obtuse or acute, often unequal, not tailed or connate with the adjoining anthers. Style-arms of the hermaphrodite flowers and the pappus as in Blumea.—Distrib. 9 or 10 species, in tropical Africa and British India.

LAGGERA FLAVA, Benth. in Gen. Pl. II. 290. A glabrous or puberulous herb, 6 to 30 in. high; stems striate, simple or corymbosely branched. Leaves membranous, shining, glabrous; the radical sometimes on short petioles; the cauline sessile; the lower cauline oblong, acute, cordate and sub-amplexicaul at the base; the upper cauline smaller and narrower than the lower, lanceolate; all sharply and unequally toothed; main-nerves about 8 pairs, distinct, like the wide reticulations. Heads few, 25 in. in diam., on slender peduncles; receptacle glabrous; corollas yellow; anthers sagittate. Cypselas minute, glabrous. Clarke Comp. Ind. 90; Hook. fil. Fl. Br. Ind. III. 270. Blumea flava, DC. Prod. V. 439. Erigeron falcatum, Don Prod. 172; Kurz in Journ. As. Soc. Beng., 1877, II. 191 (excl. syn.). Conyza fasciculata, Wall. Cat. 3017.

PENANG: Wallich.—DISTRIB. British India.

This has not been collected within our area since Wallich's time.

10. PLUCHEA, Cass.

Shrubs or herbs, tomentose or glutinous. Leaves alternate, dentate or rarely entire, sometimes pinnatifid. Heads usually small, in terminal corymbose cymes, or large and sub-solitary, heterogamous, disci-

form, white yellow, or lilac. Outer florets ♀, in several series, fertile, filiform. Disk-florets ҫ, few, sterile, tubular and 5-fid. Involucre broadly ovoid or campanulate; its bracts few or in many rows, imbricate, ovate or lanceolate, dry, rigid; receptacle flat, naked. Corollas of the ♀ flowers filiform, shorter than their own styles, their apices with 3 teeth; corollas of the ҫ flowers regular, tubular, the limb slightly widened, 5-cleft. Anthers sagittate at the base, their basal auricles tailed. Style-arms of the ҫ flowers filiform, entire or bifid. Cypselas small, 4- or 5-angled. Hairs of pappus slender, rigid, in a single series, free, or (in the sterile cypselas) connate in groups.—Distrib. About 30 species, tropical and sub-tropical.

Pluchea indica, Less.; DC. Prod. V. 451. A low shrub, glabrous or nearly so; stems smooth, terete. Leaves membranous, obovate or oblanceolate, the apex obtuse or acute, acuminate or apiculate, narrowed to the base; edges dentate, serrate or sub-serrate; both surfaces olivaceous-brown when dry, glandular; main-nerves 3 to 6 pairs, curving upwards, bold beneath; length ·5 to 2·75 in.; breadth ·3 to 1·25 in.; petioles ·1 in. to ·4 in. long. Heads ·25 in. in diam., in compound terminal puberulous corymbose cymes, much longer than the leaves; involucral bracts few, rather broad, obtuse. Florets of the disk 3; those of the ray numerous. Cypselas minute, ribbed, nearly glabrous; pappus scanty, spreading, reddish-white. Wight Ill. t. 131; Clarke Comp. Ind. 93; Hook. fil. Fl. Br. Ind. III. 272; Prain Bengal Plants 600. P. foliosa, DC. 1.c. 451. Conyza corymbosa, Roxb. Fl. Ind. III. 426; Wall. Cat. 3009. C. indica, Miq. Fl. Ind. Bat. II. 58. Baccharis indica, Linn.

Malacca: Griffith. Penang: Wallich. Singapore: Kurz. Dindings: Curtis 3451. Perak: Scortechini 848; King's Collector 2893. —Distrib. British India, Malay Archipelago, China, Australia

11. Sphæranthus, Linn.

Annual herbs with spreading branches. Leaves alternate, toothed, decurrent. Flower-heads proper, small, heterogamous, disciform, sessile, on a common receptacle, bracteate or not, and forming solitary, globose, or ovoid, a head-like terminal cluster, usually bearing at its base an involucre of a few empty bracts. Outer florets 2, few or many, fertile, slender; inner solitary or few, \$\frac{\pi}{2}\$, fertile or sterile; involucre narrow, its bracts dry, narrow, unequal, acute; receptacle small, naked; pappus none. Florets: \$\frac{\pi}{2}\$ with filiform, minutely 2-3-toothed corollas; \$\frac{\pi}{2}\$ with regular corollas with thickened tube and 4-5-toothed limb. Anthers with sagittate bases acute or tailed. Style of \$\frac{\pi}{2}\$ florets with filiform arms or entire. Cypselas oblong, sub-

compressed, without pappus.—DISTRIB. About 8 species, tropics of Asia. Africa, and Australia.

SPHÆRANTHUS AFRICANUS, Linn. Sp. Pl. 1314. Annual, glabrous or pubescent, the stem and branches with long decurrent, entire wings. Leaves membranous, oblanceolate, acute or sub-acute, with a small bristle-point at the apex, the base narrowed and confluent with the wing of the branch, the edges bristle-serrate; length 1 to 3 in.; breadth 25 to 1.25 in. Clusters of heads globose, 3 to 4 in. in diam., pedunculate, their involucres few, scarious, rounded or jagged, not imbricate; the peduncles 25 to 4 in. long, glabrous, with a wing widening at the base. Female florets about 15, gibbous. Hook. fil. Fl. Br. Ind. III. 275; Prain Bengal Plants, 601. S. africanus and S. microcephalus, Willd. Sp. Pl. III. 2395. S. microcephalus, DC. Prod. V. 360; Clarke Comp. Ind. 97. S. indicus, Willd. l.c. 2394; Roxb. Hort. Beng. 62, Fl. Ind. III. 446. S. africanus, Wall. Cat. 3179 (in part).

MALACCA: Griffith. KEDAH: King's Collector 1701. SINGAPORE: Ridley 5069. PENANG: Curtis 1942; Deschamps. PROVINCE WELLES-LEY: Ridley 7125. PERAK: Scortechini 1640.—DISTRIB. British India, Malay Archipelago, China, Philippines, Australia, Africa.

12. EMILIA, Cass.

Annual or perennial herbs, glabrous or hairy, often glaucous, sometimes sarmentose. Leaves alternate, radical, crowded, petiolate, entire, toothed or lyrate-pinnatifid; cauline few, stem-clasping. Heads on long peduncles, solitary or loosely corymbose, ebracteolate at the base, homogamous, discoid, yellow or red; florets all &, fertile, tubular, the limb elongate and 5-toothed. Involucre cylindric; its bracts in a single series, equal, free or cohering, striate; receptacle flat, naked. Style-arms sub-terete, their apices short and obtuse, or long and acute. Cypselas sub-terete, or 5-ribbed or -angled; pappus hairs numerous, white, silky.—Distrib. Species 14 or 15; all Indo-Malayan and tropical African.

EMILIA SONCHIFOLIA, DC. Prod. VI. 302. Annual, usually erect, sometimes diffuse and sarmentose, 12 to 30 in. high. Leaves: the lower lyrate-pinnatifid or sinuate-dentate, rarely elliptic, glabrous or puberulous, sometimes scaberulous, 1·5 to 4 in. long; petioles variable but rarely exceeding an inch in length; cauline leaves much smaller, hastate or linear-hastate, dentate, sessile and auriculate, more or less stem-clasping. Heads 4 in. long and the same in diam. when expanded, on long ebracteate or scantily bracteate peduncles, collected in lax terminal long pedunculate spreading corymbs. Involucre nearly as long as the purple florets, ecalyculate; its bracts linear-oblong, sub-

acute. Cypselas truncate at each end, minutely hairy. DC. in Wight Contrib. 24. E. sonchifolia, vars. α and β, Clarke Comp. Ind. 174. Calcalia sonchifolia, Linn. Sp. Pl. 835; Roxb. Fl. Ind. III. 413; Don Prod. 180; Wall. Cat. 3144. E. glabra, Heyne in Wall. Cat. 3145. Gynura ecalyculata, DC. l.e. 298. Prenanthes sarmentosa, Wall. Cat. 3262E. E. scabra, DC. l.e. 303; Wight Ic. 1123. E. mucronata, Clarke Comp. Ind. 175.

SINGAPORE: Hullett 240. Penang: Deschamps; Scortechini; Stolickza.—Distrib. British India, Malay Archipelago, China.

VAR. minor, King & Gamble. Little more than a foot high, lower leaves broadly ovate, truncate at the base, on long narrow winged petioles.

PERAK: King's Collector 301. PENANG: in Klang and Batu Gaja jungles: Deschamps.

In this variety the terminal lobe only of the leaf is developed, the lower part being long and narrow like a petiole.

13. GYNURA, Cass.

Succulent herbs, rarely undershrubs, sometimes climbers, glabrous or hispid. Leaves alternate, entire, toothed or pinnatisect. Heads solitary or in corymbs, bracteolate at the base, homogamous, disciform, yellow or purplish. Florets yellow: all the \$\frac{2}\$ tubular, fertile (rarely a few of the outer ones more slender and \$\frac{2}{2}\$) the limb 5-toothed. Involucre cylindric or sub-campanulate; the bracts 10 or 12, in a single series, narrow, equal; their margins scarious; receptacle flat, pitted or shortly fimbrillate. Anthers with bases entire or sub-auricled. Style-arms slender; their apices long, slender, subulate, hispid. Cypselas narrow, many-ribbed; hairs of pappus copious, in many series, slender, white.—Distrib. Species about 20, Asia, Africa, and Australia.

Scandent; leaves subentire or slightly dentate, petiolate .. 1. G. sarmentosa. An erect herb; leaves always boldly dentate and often pinnatisect or pinnatifid, sessile and often sub-amplexicall or auriculate .. 2. G. bicolor.

1. Gynura sarmentosa, DC. Prod. VI. 298. Stem and branches loosely twining, glabrous except the puberulous peduncles, thinner than a goose-quill, pale brown and striate when dry. Leaves succulent, elliptic to elliptic-lanceolate, acute or acuminate, the base cuneate, the edges subentire or slightly dentate, both surfaces brown when dry, glabrous; main-nerves 4 or 5 pairs, spreading, faint on both surfaces; length 1 to 3 in.; breadth 4 to 1 in.; petioles of the lower leaves 15 to 4 in.; the small upper leaves often sessile. Heads few, 65 to 75 in. long, and as much in diam., on slender puberulous

pedicels usually in scanty, lax, long-peduncled, axillary and terminal cymes longer than the leaves; bracteoles of the panicle and of the calyculus at the base of the involucre few, small, linear. Involucre spreading little, its bracts narrowly oblong, subacute or blunt, glabrous; their edges scarious, nearly as long as the florets. Cypselas small, brown, with 10 puberulous ribs; pappus white. Hook. fil. Fl. Br. Ind. III. 335. G. Finlaysoniana, DC. l.c. 299; Deless. Ic. Sel. IV. t. 55. Cacalia cylindrifolia, reclinata, and Finlaysoniana, Wall. Cat. 3150, 3151, 3162. Sonchus volubilis, Rumph. Herb. Amb. V. t. 103 f. 2.

In all the provinces, common.—DISTRIB. Malayan Archipelago; Siam; Philippines.

2. Gynura bicolor, DC. Prod. VI. 299. Herbaceous, 2 or 3 feet high, glabrous or sparsely and minutely glandular-hairy on the upper part; stems erect, branched, about the thickness of a quill near the base, boldly striate when dry. Leaves pinnatisect or pinnatifid, the lobules acutely dentate; the terminal lobe narrow and acuminate, narrowed at the base into a petiole varying in length from 5 to 1 in.; the upper sessile and often auriculate at the base, or shorter and narrowly obtuse with large teeth; length 2.5 to 5 in.; breadth 4 to 3 in. Heads about 5 in. long, less in diam. Involucral bracts narrow, with scarious margins and acute often recurved tips. Cypselas very slender, much ribbed, sub-glabrous; pappus copious, white, tinged with pink. Hook. fil. Fl. Br. Ind. III. 335. Cacalia bicolor, Roxb. Fl. Ind. III. 412; Salisb. Hort. Parad. t. 25; Bot. Regist. t. 110.

SINGAPORE: Ridley 1618. JOHORE: Ridley 2741; King. PERAK: Wray 1445, 3599. PENANG: Deschamps. MALACCA: Griffith (K.D.), 3235.—DISTRIB. China, Moluccas.

14. Siegesbeckia, Linn.

Glandular-pubescent herbs. Leaves opposite, toothed. Heads in leafy panicles, heterogamous, sub-radiate, yellow or white. Ray-florets 2, in a single series, fertile, the corollas short-tubed, with 2-3-fid limb or a short, broad ligule. Disk-florets \$\mathcal{e}\$, fertile, or the inner ones sterile; the corollas regular, tubular, the limb campanulate and 5-fid or narrow and 3- to 4-toothed. Involucre campanulate or hemispheric, the bracts few, herbaceous, glandular, the outer usually 5, spathulate, spreading; the inner enclosing the ray-florets. Receptacle small; the pales membranous, concave. Anthers with entire bases. Style of \$\mathcal{e}\$ florets with short, flattened, sub-acute arms. Cypselas obovoid-oblong, often incurved, their apices obtuse;

pappus none.—Distrib. Six species, one cosmopolitan, tropical and sub-tropical, the others South American and African.

SIEGESBECKIA ORIENTALIS, Linn. Sp. Pl. 900. An erect annual, 1 to 3 feet high, branching, the lower branches opposite, everywhere clothed with pubescence, often glandular and crisped. Leaves membranous, opposite, the lower ovate sub-rhomboid, the upper ovate-lanceolate, dentate or crenate, passing into linear-lanceolate, and sometimes entire; all cuneate at the base; both surfaces olivaceous when dry; the upper scabrid, hispid; the lower more softly hairy; main-nerves 3 or 4 pairs, curved, spreading; length 1 to 4 in.; petioles very short or absent. Involucre with the outer bracts longer than the inner. Cypselas black, the outer enclosed in the glandular involucral bracts. Boiss. Fl. Orient. III. 250; DC. Prod. V. 495; Wight Ic. 1103; Wall. Cat. 3182; Hook. fil. Fl. Br. Ind. III. 304; Prain Bengal Plants, 607. S. glutinosa, Wall. Cat. 3182. S. brachiata and S. orientalis, Roxb. Fl. Ind. III. 432. Minyranthes heterophylla, Turez. in Bull. Soc. Imp. Nat. Misc. 1851, I. 181.

In all the provinces, near habitations.

15. ECLIPTA, Linn.

Strigose or hirsute annuals. Leaves opposite. Heads small, axillary or terminal, pedunculate, heterogamous, rayed. Ray-florets 2, sub-2-seriate, fertile or sterile, ligulate, small, entire or bifid, white rarely yellow. Disk-florets 2, fertile, tubular, 4–5-fid. Involucre hemispheric or broadly campanulate; its bracts sub-2-seriate, herbaceous, the outer large and broad; receptacle flat or nearly so, the outer pales enclosing several florets; the inner ones narrow, sometimes absent. Anthers with obtuse, almost entire, bases. Style-arms flattened, with short triangular or obtuse appendages. Cypselas of the ray narrow, triquetrous, sometimes barren; those of the disk stouter, somewhat compressed laterally, the apex entire, toothed or 2-aristate.—Distrib. 7 species in South America and Australia, and 1 cosmopolitan in the tropics.

Eclipta erecta, Linn. Mant. II. 266. An erect or diffuse branched slender herb, hirsute or strigillose. Leaves variable in form and size, sessile or with very short petioles; linear, oblong-lanceolate or narrowly elliptic; narrowed at both ends; main-nerves 3 or 4 pairs, spreading, faint; length 1 to 4 in.; breadth 2 to 5 in. Heads 3 to 4 in. in diam., solitary or in pairs from the leaf-axils; the peduncles 25 to 1.5 in. long, when in pairs always unequal. Involucral bracts equal to or longer than the flowers, unequal, ovate or obovate, apiculate. Cypselas scabrid, without pappus. Clarke Comp. Ind. 134; Hook.

fil. Fl. Br. Ind. III. 304; Prain Bengal Plants; 610. Lam. Ill. t. 687. E. alba, Hassk. Pl. Jav. Rar. 528; Clarke Comp. Ind. 134; Hook. fil. Fl. Br. Ind. III. 304. E. marginata, Boiss. Fl. Orient. III. 249. E. prostrata, Linn. Mant. II. 266; Roxb. Fl. Ind. III. 438. E. prostrata, undulata, and parviflora, Wall. Cat. 3209, 3210, 3213. Verbesina alba and prostrata, Linn. Sp. Pl. 902.

In all the provinces. In and near cultivated ground.—DISTRIB.

The tropics generally.

16. WEDELIA, Jacq.

Hirsute or scabrid-pubescent herbs or undershrubs, sometimes scandent. Leaves opposite. Heads axillary or terminal, heterogamous, rayed. Ray-florets ?, fertile, ligulate, spreading, entire, or 2-toothed at the apex. Disk-florets ?, fertile or the inner sterile; the corolla tubular, regular, with elongate 5-toothed limb. Involucre campanulate or sub-hemispheric; its bracts sub-2-seriate, the outer 3 to 5 usually herbaceous, the inner dry; receptacle flat or convex, the pales enclosing the flowers. Anthers entire or sub-sagittate at the base. Style of ? florets with acute arms hirsute at their tips. Cypselas cuneate-oblong or obovoid, thick, smooth or tubercled, laterally compressed or the outer triquetrous, tip rounded, margins obtuse or thickened; pappus none, or reduced to a toothed cup or ring, or sometimes of short scales with occasionally a few bristles.—Distrib. Species about 70, tropical and sub-tropical.

WEDELIA BIFLORA, DC. in Wight Contrib. Fl. Ind. 18. Scandent; stem and branches hispid-puberulous when very young, afterwards almost glabrous, obtusely 4-angled, grooved when dry. Leaves membranous, broadly ovate or ovate-subrhomboid to lanceolate, apex acuminate, edges coarsely serrate except at the broad, slightly cuneate base; both surfaces dull olivaceous green when dry, minutely reticulate, sparsely hispid-puberulous; main-nerves one large pair ascending from the base of the midrib to near the apex branching outwards and one or two smaller pairs from above the middle of the midrib, all distinct on both surfaces; length 2 to 4.5 in.; breadth 1.25 to 2.75 in.; petioles .75 to 1.5 in., those of the branches smaller. Heads about 5 in. in diam., solitary on a short peduncle .75 in. or less in length, or 2 to 4 on peduncles two or three times as long. Involucral bracts in two rows, oblong or ovate-lanceolate, apiculate, concave, scabrid-puberulous outside like the peduncles, often recurved. Ripe cypselas triquetrous, scaberulous, the apex with some hairs and several short bristles, one longer than the others. Hook. fil. Fl. Br. Ind. III. 306. W. scandens, Benth.; Prain Bengal Plants, 612; Clarke Comp. Ind. 136 (excl. syn.). Woolastonia biflora and W. scabriuscula, DC. Prod. V. 546, 547. W. biflora, Wight Ic. 1108. Verbesina biflora, Linn. Sp. Pl. Ed. II. 1272. Wall. Cat. 3207 (in part). V. dichotoma, Wall. Cat. 3024 (in part). Eclipta scabriuscula, Wall. Cat. 3212 (partly). Acmella biflora, Spreng. Syst. III. 591.

On the sea coast, common.

17. SPILANTHES, Linn.

Annual herbs. Leaves opposite. Heads axillary or terminal, usually on long peduncles, heterogamous and rayed, or homogamous and disciform. Ray-florets 2, in a single series, fertile, ligulate, white or yellow. Disk-florets 2, fertile, tubular, with 4- or 5-fid limb. Involucre ovoid or campanulate, the bracts sub-2-seriate; receptacle convex, elongate, the pales enclosing the flowers often connate with the ovary into a stalk. Anthers with truncate entire or bifid bases. Style-arms of 2 florets truncate. Cypselas of ray-florets triquetrous or dorsally compressed, the margins and angles usually ciliate; pappus none or of 2 or 3 bristles.—Distrib. About 40 species, chiefly tropical American.

SPILANTHES ACMELLA, Murr. Syst. ed. XIII. 610. Erect or ascending, glabrous, branched, 1 to 2 feet long; the branches as thick as a crow-quill, striate, glabrous, pale brown when dry. Leaves membranous, ovate-lanceolate or elliptic, with sub-acute apex and cuneate base, the edges crenate serrate or entire; main-nerves a single pair, ascending; length .75 to 1.5 in.; petioles .1 to .3 in. long. Heads ovoidconical, 35 to 5 in. long, on slender peduncles 1 to 25 in long, solitary or in very lax panicles. Involucral bracts short, oblong, blunt or subacute, 3-nerved. Ray-florets minute. Cypselas sometimes marginate, scabrid or smooth; pappus of one or two bristles or absent. DC. Prod. V. 623; Prain Bengal Plants, 614; Wall. Cat. 3285; Clarke Comp. Ind. 138; Hook. fil. Fl. Br. Ind. III. 307. S. calva, DC. l.c. V. 625; Wight Ic. 1109. S. pseudo-Acmella, Linn.; DC. l.c. 625, and in Wight Contrib. 19; Wall. Cat. 3185. S. oleracea, Jacq. Hort. Vind. II. t. 135; Roxb. Fl. Ind. III. 410; DC. l.e. 624. Bidens fervida and B. fixa, Lamk. Dict. I. 415, 416. Cotula conica, Wall. Cat. 3185. Verbesina Acmella, Linn. Sp. Pl. 901. V. pseudo-Acmella, Linn. l.c. 901.

MALACCA: Griffith (K.D.) 3186; Cuming 2361. Perak: Scortechini 1400. Penang: Deschamps.

18. Synedrella, Gaertn.

Annual branched herbs. Leaves opposite, petiolate, dentate. Heads small, axillary and terminal, heterogamous, rayed. Involucre ovoid or

oblong, its bracts few; the outer one or two foliaceous, passing into the flat scarious pales of the small receptacle. Ray-florets few, ?, ligulate, with short broad 2-3-toothed lamina. Disk-florets &, tubular, regular, the limb 4-toothed. Anthers syngenesious, their bases sub-entire. Style-arms of & florets long, acute. Cypselas of ray-florets much compressed dorsally, smooth, their edges winged and with long teeth; those of the & few, narrower, compressed or trigonous often muricate; pappus in both consisting of 2 (rarely more) bristles.—Distrib. Species 2, tropical American, 1 also Asiatic and African.

SYNEDRELLA NODIFLORA, Gaertn. Fruct. II. 456, t. 171, f. 7. erect dichotomous annual with terete wiry glabrous branches thicker than a crow-quill; all parts more or less scaberulous. Leaves membranous, opposite, petiolate, ovate, acute, the base cuneate, the edges serrate or crenate (sometimes obscurely so); main-nerves 3 or 4 pairs, the lower pair long and bold, the others short and faint; both surfaces minutely and sparsely strigose, and greenish when dry; length '75 to 3 in.; breadth 3 to 1.25 in.; petioles 1 to 4 in. often ciliate on the edges. Heads 25 in. in diam., axillary, solitary or in small clusters, usually sessile but sometimes on short peduncles; inner bracts of the involucre linear-lanceolate, shining. Cypselas of the inner flowers muricate, with 2 unequal hispid pappus hairs longer than themselves and than the corolla; outer cypselas shorter, broader, smooth, black; their edges winged, deeply toothed, pale. Hook. Exot. Flora, t. 60; Clarke Comp. Ind. 139; Hook. fil. Fl. Br. Ind. III. 308; Prain Bengal Plants, 615. Verbesina nodiflora, Linn. Amoen. Acad. IV. 290.

Near cultivation, common.

19. BIDENS, Linn.

Herbaceous, annual or perennial, sometimes scandent. Leaves opposite, entire, irregularly lobed or 1-2-pinnatisect. Heads small and corymbose or larger and sub-solitary, heterogamous and rayed. Rayflorets in one series, neuter or rarely 2, fertile, the corolla ligulate, yellow or white, spreading, entire or somewhat toothed. Disk-florets \$\frac{x}{2}\$, fertile, tube, cylindric, limb shortly 5-fid; occasionally homogamous from the abortion of the ray-florets. Involucre campanulate or sub-hemispheric, its bracts in two series, often slightly connate below; the outer short herbaceous or long and leafy, the inner membranous; receptacle flat or convex; its pales narrow, little concave. Anthers entire or bluntly sagittate at the base. Style of \$\frac{x}{2}\$ florets with arms hirsute upwards and short acute or long apices. Cypselas dorsally compressed or somewhat tetragonous, linear or cuneiform, often narrowed but not beaked above; pappus of 2 to 4 persistent,

retrorsely barbellate arms.—Distrib. About 120 species, chiefly American.

BIDENS PILOSA, Linn. Sp. Pl. 832. An erect, very variable, glabrous pubescent or pilose herb, 6 to 24 in. high; stems when dry 4-angled. Leaves 3-fid to 3-partite, or 2-3-pinnatifid, their segments broadly or narrowly ovate to lanceolate, serrate. Heads 3 to 4 in. across, on long stout petioles of varying length, terminal or axillary. Ray-flowers when present white or yellow, often absent. Involucral bracts shorter than the flowers, broadly oblong, with scarious margins. Cypselas black, compressed, long, narrow, slender, ribbed; pappus of 3 or 4 bristles shorter than the cypselas, pale brown.

Var. 1 pilosa proper, Hook. fil. Fl. Br. Ind. III. 309; leaves 3-fid or 3-sect, their segments broadly or narrowly ovate or lanceolate, serrate. B. pilosa, Linn.; DC. Prod. V. 597; Clarke Comp. Ind. 140; Prain Bengal Plants, 616. B. leucantha, Willd. B. chinensis, Willd.; Wall. Cat. 3189 (in part). B. tripartita and B. bipinnata, Wall. Cat. 3187 (in part).

Var. 2 bipinnata, Hook. fil. l.c. 309; leaves bipinnately compound, their segments ovate lanceolate or linear, entire lobed or toothed. B. bipinnata, Linn.; Roxb. Fl. Ind. III. 411. B. chinensis, Wall. Cat. 3189 (in part). B. Wallichii, DC. Prod. V. 598.

Var. 3 decomposita, Hook. fil. l.c. 310; leaves decompoundly pinnatifid, segments linear, slender. B. decomposita, Wall. in DC. Prod. V. 602, Cat. 3188; Clarke Comp. Ind. 141 excl. var. β .

In all the provinces: in waste ground near cultivation, but not common.—DISTRIB. In all warm countries.

20. TRIDAX, Linn.

A perennial herb. Leaves opposite, pinnatisect, with few narrow segments. Heads solitary on very long peduncles, heterogamous, rayed. Ray-florets 2, fertile, ligulate or bilabiate, the outer lip large 3-fid, the inner small and 2-fid or none. Disk-florets 2, fertile, tubular, the limb elongate and 5-fid. Involucral bracts in few series, the outer short broad herbaceous; receptacle flat or convex; its scales membranous. Anthers with short acute auricles at their bases. Style-arms of the 2 flowers hairy above, their apices subulate. Cypselas oblong or depressed-globose, silky; pappus of unequal aristate feathery bristles.—Distrib. 7 species, tropical American, 1 being an introduced weed in the tropics of Asia.

TRIDAX PROCUMBENS, Linn. Sp. Pl. 900. Procumbent, hirsute, with slightly branched stems as thick as a crow-quill. *Leaves* membranous, few, ovate-lanceolate, deeply and irregularly serrate, ·5 to 2 in. long.

Heads 4 to 6 in. in diam., on slender erect solitary peduncles 3 to 8 in. long. Cypselas brown; pappus shining, white. DC. Prod. V. 679; Wall. Cat. 3197; Clarke Comp. Ind. 142; Hook. fil. Fl. Br. Ind. III. 311; Prain Bengal Plants, 618.

In cultivated and waste places: an introduction.

21. CENTIPEDA, Lour.

Annual or perennial herbs. Leaves alternate, entire or toothed. Heads small, axillary, sessile or racemose, heterogamous, disciform, yellow. Outer florets 2, in many rows, fertile, their corollas minute, obscurely lobed. Disk-florets \$\frac{x}{2}\$, few, fertile, their corollas with short tube and campanulate 4-fid limb. Involucre hemispheric, its bracts in 2 series, spreading in fruit; receptacle naked. Anthers obtuse and entire at the base. Style-arms of \$\frac{x}{2}\$ flower short, truncate. Cypselas 4-angled, the apices obtuse, the angles hairy; the hairs sometimes hooked; pappus none.—Distrib. 43 species, Asiatic, Australian, and South American.

Centifeda orbicularis, Lour. Fl. Cochinch. III. 493. An annual prostrate herb with numerous thin rooting stems, glabrous or sparsely tomentose. Leaves obovate-oblong or cuneate, 2 to 5 in. long, sparsely toothed. Heads 1 to 15 in. in diam., globose, solitary, axillary, subsessile. Florets, 2 minute, numerous, tubular, minutely 3-toothed; 10 to 12, 4-toothed. Cypselas with simple hairs. Hook. fil. Fl. Br. Ind. III. 317; Prain Bengal Plants, 620. C. minuta, Benth. in Bth. & Hook. fil. Gen. Pl. II. 230; Clarke Comp. Ind. 151. Myriogyne minuta, Less.; DC. Prod. VI. 139. Cotula sternutatoria, Wall. Cat. 3259. C. minima, Willd. Sp. Pl. III. 2170. Dichrocephala Schmidii, Wight Ic. 1610. Artemisia sternutatoria, Roxb. Fl. Ind. III. 423. A. minima, Linn. Sp. Pl. 849. Sphæromorphæa centipeda, DC. l.c. 140.

In all the provinces: by the sides of roads in cultivated ground, not common.

22. ARTEMISIA, Linn.

Herbs or shrubs, usually fragrant. Leaves alternate, 1- to 3-pinnatisect, serrate or entire. Heads small, numerous, racemose or panicled, solitary or in fascicles (never corymbose), heterogamous or homogamous, disciform. Outer florets 2, in a single series, fertile, very slender, 2- to 3-toothed. Disk-florets \$\frac{2}\$, fertile or sterile, the limb 5-fid. Involucre ovoid, sub-globose or hemispheric; bracts in few series, the outer shorter, their margins scarious; receptacle flat or convex, naked or hairy. Anthers with entire obtuse bases. Style-arms of the \$\frac{2}{2}\$ florets with truncate, usually penicillate, tips. Cypselas very minute, oblong,

ellipsoid or sub-obovoid, faintly striate; pappus none.—DISTRIB. About 240 species in the north temperate regions mostly of the Old World.

ARTEMISIA VULGARIS, Linn. Sp. Pl. 848. A small shrub; stems as thick as a goose-quill, brown when dry, sub-glaucous and with sparse white pubescence. Leaves membranous, varying much in shape and size, those near the base several inches long, large pinnatipartite or bi-pinnatipartite, the pinnules oblong, the ultimate lobes entire with sub-aristate apices, leaves of the stem diminishing in size upwards, laciniate, and passing near the apex into simple linear bracts less than ·5 in. long; all glabrous on the upper surface and white adpressedpubescent on the lower. Heads about 15 in. long, cylindric or narrowly campanulate, sessile, solitary or in small clusters, in axillary sub-secund spikes of varying length, the upper part of the stem forming a long spike. Involucral bracts only 5 or 6, broadly lanceolate or oblanceolate, the inner scarious. Corollas glabrous. DC. Prod. V. 112; Boiss. Fl. Orient. III. 371; Roxb. Fl. Ind. III. 420; Clarke Comp. Ind. 161; Hook. fil. Fl. Br. Ind. III. 325. A. indica, Willd.; DC. l.c. 114; Roxb. Fl. Ind. III. 419; Wight Ic. 1112; Wall. Cat. 3293. A. dubia, Wall. Cat. 3307; DC. l.c. 110. A. myriantha, Wall. Cat. 3297; DC. l.c. 112. A. paniculata, Roxb. Fl. Ind. III. 418. A. leptostachya, DC. l.c. 113. A. grata, Wall. Cat. 3294 (in part); DC. l.c. 114. A. lavandulæfolia, DC. l.c. 110.

In all the provinces, near cultivation, not common and probably introduced.—DISTRIB. Europe, Northern Asia, India, mountains of the Malayan Archipelago.

23. CREPIS, Linn.

Annual or perennial herbs, glabrous or hairy, hairs all simple. Leaves alternate, radical or cauline, the latter often stem-clasping, entire toothed or pinnatifid. Heads pedunculate, solitary, fasciculate or corymbose, yellow or red, homogamous, ligulate. Involucre cylindric or campanulate; bracts either multi-seriate and regularly imbricate, or the outer smaller and shorter than the single series of inner; base of midrib often thickened after flowering; receptacle flat, rarely concave, naked or shortly fimbrillate. Corollas ligulate, with broad 5-toothed apices. Anthers syngenesious, their bases sagittate, the auricles acute or shortly setaceous. Cypselas more or less fusiform or oblong, rarely short and cylindric, often slender, glabrous or scaberulous, 10- to 20-ribbed, the apex narrowed or beaked; pappus usually copious, short or long, the hairs simple, soft, usually silvery, rarely brownish and stiff or brittle.—Distrib. Species about 10, chiefly in the northern regions of the Old World.

CREPIS JAPONICA, Benth. Fl. Hongk., 194. Annual; glabrous or puberulous; stems one or more from the same root, 6 to 18 in. high. Radical leaves oblanceolate, runcinate-pinnatifid or sinuately toothed, 1 to 2.5 in. long, usually on petioles .5 to 1.5 in. long; cauline leaves few, much smaller and often sessile. Heads ·2 in. long and ·3 in. in diam. when expanded, on short, slender pedicels with linear minute bracteoles at their bases, collected at the apices of the long, slender stems in compact or lax corymbose cymes. Involucres shorter than the florets, their bracts in two rows, the outer very short; the inner 6 or 7, narrowly oblong, blunt, with narrow hyaline margins and dark, thickened midribs. Cypselas 1 in. long, contracted below the apex, but not beaked, compressed, with many smooth or puberulous ribs, equal to or shorter than the soft, white pappus. Hook. fil. Fl. Br. Ind. III. 395; Prain Bengal Plants, 627. C. lyrata, Clarke Comp. Ind. 253. Youngia lyrata, Cass.; Thw. Enum. Pl. Ceyl. 168. Youngia Thunbergiana, runcinata, napifolia, Poosia, ambigua, fastigiata and striata, DC. Prod. VII. 192, 193. Y. napifolia, Wight Ic. 1147. Lactuca napifolia, DC. in Wight Contrib. 27. Chondrilla runcinata, Wall. Cat. 3272. Prenanthes Poosia and napifolia, Wall. Cat. 3265, 3277. P. japonica, Linn. Mant. 107. P. striata, Blume Bijdr. 885.

In all the provinces, near or in cultivated ground.

Order LXII. STYLIDIEÆ.

Herbaceous plants, rarely undershrubs. Leaves radical or scattered or fasciculate on the stem, more or less subverticillate, entire, often small and narrow, no stipules. Flowers in terminal racemes or thyrsoid or corymbose panicles, irregular, perfect, pedicels bracteate. Calyxtube adnate to the ovary; limb 2-lipped, upper lip 3-, lower 2-flowered. Corolla gamopetalous, 5-lobed, 4 lobes spreading, the fifth (lip) smaller, irregular, the lobes imbricate. Stamens 2, parallel, inserted on a glandular disk surmounting the ovary; filaments connate with the style into a column; anthers sessile on the column, the cells subconfluent. Ovary inferior, 2-celled; style entire or divided into two stigmas; ovules many in each cell, on axile placentas on the middle of the dissepiment, anatropous. Fruit a 2-celled capsule, sometimes 1-celled by the suppression of the septum, the valves cohering at the base. Seeds minute, numerous, sub-globose; albumen fleshy; testa thin; embryo minute, next the hilum.—DISTRIB. Species about 100, Australian, with a few in tropical Asia, New Zealand, and Antarctic America.

STYLIDIUM, Sw.

Herbs, with the habit leaves and inflorescence of the Order. Calyx-lobes 5, bilabiate. Corolla irregularly 5-lobed, 4 lobes sub-erect in pairs, the fifth smaller, recurved. Stamens in an elongate column, often recurved or reflexed, especially when irritated. Ovary 2-celled, stigma entire.—Distrib. 85 Australian species and 3 Indian or Malayan.

STYLIDIUM TENELLUM, Swartz in Gesellsch. Nat. Berl. Mag. 1807, 51. t. 2, fig. 3, not of Br. A small erect herb; stem simple, leafy, glabrous, 4 to 8 in. high, dichotomous, compressed. Leaves scattered, alternate, oblong or oblong-obovate, lower ones broader ·2 to ·3 in. long, upper ones narrower, getting gradually smaller upwards and passing gradually into bracts; nerves of lower leaves 3, from the base. Flowers sessile, 2 to 5, alternate; bracts minute, linear. Calyx bilabiate, upper 3-, lower 2-lobed, lobes linear. Corolla irregularly 5-lobed, 4 lobes erect linear, the fifth recurved, spathulate. Staminal column exsert, stamens 2, anthers 2-celled, connivent. Ovary inferior, elongate, 2-celled, many-seeded, stigma entire. Capsule 2-celled, 2-valved, ·5 to ·7 in. long; seeds minute, papillose. DC. Prod. VII. 336; Hook. fil. and Th. in Journ. Linn. Soc. II. 8; Miq. Fl. Ind. Bat. II. 571; Kurz in Flora, 1872, 304. S. roseum, Kurz in Journ. As. Soc. Beng. XLV. ii. 137, XLVI. ii. 212; Clarke in Hook. f. Fl. Br. Ind. III. 420.

Penang: Ridley 7103. Province Wellesley, at Butterworth: G. King. Malacca: Swartz.—Distrib. Eastern Bengal and Burma, in Dacca, Chittagong and Mergui.

S. uliginosum, Swartz, is recorded in Fl. Br. Ind. as from "Malacca fide H. f. and T."; as we have seen no specimens, we consider it sufficient to record the fact. In Miq. Fl. Ind. Bat. it is S. Kunthii, Wall., that is recorded from Malacca, and it seems more likely that this is right as Griffith obtained it at Mergui.

Order LXIII. GOODENOVIEÆ.

Shrubs, undershrubs, but chiefly herbs, juice not milky. Leaves alternate or radical, rarely opposite, entire dentate or occasionally pinnatifid; stipules none. Flowers hermaphrodite, axillary or in terminal spikes, racemes or panicles, regular or irregular, bracts and bracteoles occasionally present. Calyx with the tube adnate to the ovary or free; lobes 5, sometimes very small, sometimes connate in a ring or obsolete. Corolla gamopetalous, inserted on the calyx, usually white, yellow or blue, rarely red; lobes 5, valvate, usually induplicatewinged. Stamens 5, alternate with the corolla-lobes, inserted on the

disk crowning the ovary; free or connate in a ring around the style; anthers 2-celled, the cells parallel, dehiscing longitudinally and introrsely. Ovary 1-2-celled; style simple with a cup-shaped sheath including the stigma; ovules 1 or many in each cell, erect or ascending, rarely pendulous, inserted on the dissepiment or central. Fruit an indehiscent drupe or a capsule with 2 or 4 valves usually dehiscing irregularly. Seeds albuminous; testa thin crustaceous or thick and hard; embryo erect in the axis of the fleshy albumen, the radicle inferior.—Distrib. Over 200 species, mostly Australian, a few in New Zealand, Antarctic America, the Pacific Islands, or on the coasts of tropical Asia, Africa, and the West Indies.

1. Scævola, Linn.

Herbs, undershrubs or shrubs. Leaves simple, alternate, rarely opposite, entire or toothed. Flowers axillary, solitary or in dichotomously branched cymes, sessile or pedicellate. Calyx with the tube adnate to the ovary, turbinate, ovoid or globose; limb short, annular or 5-lobed, sometimes obsolete. Corolla oblique, split to the base behind, lobes sub-equal or the two uppermost shorter, at length digitately patent. Stamens free. Ovary 2-celled, with solitary erect ovules in each cell, or 1-celled with 1-2 erect ovules; sheath cupular; stigma truncate or divaricately 2-lobed. Fruit an indehiscent drupe, exocarp thin or fleshy, endocarp hard and woody rarely crustaceous. Seeds solitary; embryo smooth, cotyledons sometimes broader than the inferior radicle.—Distrib. About 60 species, 2 Asiatic, 8-10 of the Pacific Islands and the coasts of Asia, 1 extending to the coasts of Africa and the West Indies, the rest Australian.

SCEVOLA KOENIGII, Vahl Symb. III. 36 (1794). An evergreen large glabrous shrub with stout stem and branches, soft spongy pith and coarse fibrous wood. Leaves alternate, sessile, obovate-oblong, obtuse at apex, decurrent at base, 3 to 6 in. long, about 2 in. broad, entire or obscurely crenate, more or less fleshy when green, membranous when dry, silky pubescent on both sides or somewhat glabrous on the upper surface, tufted hairy in the axils; midrib stout, prominent, broad, main-nerves 10-12 pair, slender, arching upwards and joining near the margin, secondary nerves few slender, reticulations many, indistinct. Flowers white, in axillary few-flowered dichotomous pubescent cymes shorter than the leaves; bracts small, subulate, about ·1 in. long; common peduncle ·5 to ·6 in. long; pedicels ·1 to ·2 in. long; bracteoles 2, similar to the bracts. Calyx-tube adnate to the ovary, ·2 in. long, densely villous; lobes ·2 to ·3 in. long, linear-lanceolate or spathulate, ciliate, pubescent, enlarged in fruit. Corolla-tube .7 to .8 in.

long, narrow, pubescent without, villous within; lobes valvately induplicate-winged, 25 to 4 in. long, lanceolate, prominently veined, villoushairy within. Stamens erect, free, inserted around the ovary-sheath. ·75 in. long; filaments thin, anthers ovate, introrse, cells parallel, connective produced above with short divergent lobes. Ovary 2-celled. crowned with the oblong bifid stigma which is surrounded by a longfringed sheath; ovules 1 in each cell, erect. Fruit a 2-celled ovateglobose succulent drupe, 3 to 5 in. in diam., depressed above, ribbed. endocarp bony. Lamk. Ill. t. 124, fig. 2; DC. Prod. VII. 505; Hook. f. and Th. in Journ. Linn. Soc. II. 8; Hook. f. Bot. Mag. t. 2732; Blume Bijdr. 730; Mig. Fl. Ind. Bat. II. 580; Kurz in Journ. As. Soc. Beng. XLVI. ii. 212, For. Fl. II. 84; Clarke in Hook. f. Fl. Br. Ind. III. 421; Trimen Fl. Ceyl. III. 54; Cooke Bomb. Flora, II. 69; Benth. Fl. Austr. IV. 86. S. sericea, Forst.; DC. l.c. 506; Blume Bijdr. 750; Miq. Fl. Ind. Bat. II. 581. S. Taccada, Roxb. Hort. Beng. 15, Fl. Ind. I. 527; DC. l.e. 505; Dalz. and Gibs. Bomb. Fl. 134; Ham. in Trans. Linn. Soc. XVII. 250; Wall. Cat. 1314; Wight Ill. t. 137. S. Lobelia, Ham. in Trans. Linn. Soc. XVII. 250; De Vriese Goodenov. 20-26 and in Ned. Kruidk. Arch. II. 20, not of Linn. S. Plumieri, Blume Bijdr. 730, not of Vahl. S. montana, Lab. Sert. Austr.-Caled. 41, t. 42; DC. l.c. 506. S. velutina, Presl in Rel. Haenck. II. 57; DC. l.c. 506. S. Bela-Modagam, Roem. and Sch. Syst. V. 163; DC. 1.c. 505. S. Leschenaultii, DC. 1.c. 506. S. macrocalyx, De Vriese Gooden. 26, tab. 3, figs. 1-4. S. chlorantha and S. Lambertiana, De Vriese, l.c. 27, 28. S. lativaga, Hance in Walp. Ann. II. 1054. Lobelia frutescens, Linn. Fl. Zeyl. 148. L. Taccada, Gærtn. Fruct. I. 119, tab. 25, fig. 5. L. Plumieri, Burm. Fl. Ind. 186, not of Linn. Cerbera Salutaris, Lour. Fl. Cochinch. 136. Buglossum litoreum, Rumph. Herb. Amb. IV. 116, t. 54. "Béla-Modagam," Rheede Hort. Mal. IV. t. 59.

Penang: Wallich 1314. Malacca: Griffith. Johore: Jensen. Singapore: Sir R. Schomburgk 82; G. King; G. Thomson.—Distrib. Sea-shores of India from Sind to Ceylon; Burma; Malay Islands and eastwards to Australia and Polynesia.

Order LXIV. CAMPANULACEÆ.

Herbs, undershrubs, rarely shrubs; erect or climbing; often with milky juice. Leaves alternate or rarely opposite, entire toothed or rarely lobed, no stipules. Inflorescence axillary or terminal; flowers solitary, racemose or paniculate; bracts small; bracteoles none (present in Sphenoclea). Calyx-tube adnate to the ovary, limb few- or many-

lobed or -partite, lobes usually persistent in fruit, valvate or imbricate in bud. Corolla gamopetalous, tubular, rotate or campanulate, superior. sometimes bilabiate; lobes as many as those of the calvx, valvate or induplicate-valvate, sometimes 1, 2, or all free to the base. Stamens equal in number to the corolla-lobes and alternate with them; inserted on the epigynous disk or (in Sphenoclea) on the corolla-tube; filaments free or connate in a tube; anthers linear, oblong or ovate, free or connate in a tube, 2-celled, the cells parallel, dehiscing longitudinally and introrsely. Ovary usually inferior, 2-5- rarely more-celled; placentas axile, many oyuled; style simple, clavate, within the staminal tube; stigma-lobes as many as the ovary-cells; ovules anatropous, erect horizontal or pendulous. Fruit capsular or baccate, crowned by the persistent calvx-lobes, dehiscing vertically or laterally, or indehiscent. Seeds very many, small, albuminous; testa thin, coriaceous; embryo erect. radicle inferior.—DISTRIB. Over 1,000 species, scattered throughout the globe, chiefly in temperate regions.

Tribe I. LOBELIEÆ. Corolla 2-lipped, cleft dorsally to the base; anthers connate.

Fruit a capsule, 2-valved at the summit 1. Lobelia.

Tribe II. CAMPANULEÆ. Corolla regular; anthers free or imperfectly connate.

Flowers solitary, peduncled 2. Campanumæa.

Flowers in a dense scorpioid spike 3. Pentaphragma.

Flowers in a dense cylindric spike 4. Sphenoclea.

1. Lobelia, Linn.

Herbs of various sizes, sometimes very small, sometimes erect and very tall; undershrubs or shrubs. Leaves alternate, usually toothed. Inflorescence either 1-flowered, in the axils of leaves or bracts, or in a terminal leafy raceme; bracteoles very small or none. Calyx-tube adnate to the ovary, turbinate, hemispheric; obovoid or rarely oblong-linear; limb 5-partite or 5-fid, lobes often unequal. Corolla oblique, 2-lipped; upper lip 2-, lower 3-partite or -lobed. Staminal tube free from the corolla or adnate only at the base; anthers with 2 lower tipped with bristles, 3 upper naked, or else all penicillate. Ovary inferior, 2-celled; placentas hemispheric; ovules numerous; stigma shortly bifid. Capsule loculicidally 2-valved within the calyx-tube. Seeds very many, minute, ellipsoid, compressed or trigonous.—Distrib. About 200 species, throughout the world, though scarce in Europe and Western Asia.

LOBELIA AFFINIS, Wall. Cat. 1311. A prostrate often rooting herb with much-branched stem, pubescent or glabrate. Leaves ovate-

rotundate, acute at apex, rounded or truncate or cordate and more or less decurrent at base, 5 to 2 in. long, 5 to 1.5 in. broad, mucronatedentate or -crenate, membranous, usually strigosely hairy on the nerves especially beneath, sometimes nearly glabrous; midrib slender, main-nerves 4-6 pairs; petiole 3 to 6 in. long, more or less winged by the decurrent margins of the blade, strigosely hairy. Flowers single. on slender pedicels about 6 to 1 in. long; bracts minute; pedicels usually deflexed in fruit. Calyx-tube adnate to the ovary, ribbed. strigose, obconical; lobes 5 linear spreading, ·1 to ·2 in. long, pilose. Corolla purple, 2 to 25 in. long, 2 upper lobes falcate-lanceolate. 3 lower connate, teeth short. Staminal tube as long as or longer than corolla, anthers all penicillate. Ovary 2-celled, style long, stigma bifid. lobes rounded, recurved, ovules many. Capsule ribbed, strigose. Seed small, ellipsoid trigonous. DC. Prod. VII. 360; Miq. Fl. Ind. Bat. II. 574; Hook. f. and Th. in Journ. Linn. Soc. II. 27; Clarke in Hook. f. Fl. Br. Ind. III. 424; Trimen Fl. Cevl. III. 57; Prain Beng. Plants I. 633. L. zeylanica, Wall. in Roxb. Fl. Ind. ed. Carey and Wall. II. 113; Kurz in Journ. As. Soc. Beng. XLVI. ii. 211, not of Linn. L. subcuneata, Mig. Fl. Ind. Bat. II. 574. L. succulenta and L. Heyneana, Bl. Bijdr. 728.

Penang: Ridley 7162, 10185; J. Scott. Perak: Ridley 2902; Curtis 2025; Scortechini 309, 344; King's Collector 2376. Singapore: Kurz.—Distrib. Eastern Bengal, Burma, Ceylon, Malay Islands, Southern China.

Isotoma longiflora, Presl, is an introduced West Indian plant found in shady places. Penang: Deschamps. Singapore: Hullett 29; Kunstler 90.

2. Campanumæa, Blume.

Perennial erect or climbing herbs with tuberous roots. Leaves opposite, petiolate, usually cordate. Flowers usually large, solitary, peduncled, terminal or axillary on short leafless flowering branches. Calyx-tube adnate to the ovary, or below it, persistent, 4- to 6-partite with spreading lobes. Corolla broadly campanulate, the base adherent to the calyx-tube, 4- to 6-lobed; white, greenish, or lurid-purple in colour. Stamens 4-6, inserted round the base of the corolla-tube; filaments dilated; anthers free. Ovary 4-6-celled, placentas thick, many ovuled; style cylindric, stigma 4-6-cleft with short broad lobes. Fruit a berry, sub-globose or with truncate top, indehiscent. Seeds very many, small, ellipsoid.—Distrib. 5-6 species, all of Eastern tropical and sub-tropical and temperate Asia.

CAMPANUMÆA CELEBICA, Blume Bijdr. 727. An erect herb reaching 4 to 5 feet in height, with horizontal spreading smooth branches.

Leaves ovate-lanceolate, acuminate, rounded at base or cuneate, often unequal, 3 in. long, 75 to 1 in. broad, serrate or almost entire, the serratures mucronate; chartaceous; glabrous above, glaucous and glabrous or with scattered pubescence beneath; midrib slender, mainnerves 4-6 pairs at about 30 degrees with the midrib, arching and joining near the margin; petiole short, 15 to 25 in. long. Flowers solitary, terminal or in the forks of a dichotomous cyme; peduncles ·3 to ·5 in. long, those of terminal flowers shorter; bracts small linear. Calyx-tube in bud shortly adnate to the ovary, in fruit often half-way up; teeth ·2 to ·3 in. long, linear-lanceolate, often serrate. Corolla epigynous, shortly campanulate, white or yellowish-white, 3 to 5 in. long; lobes 5, triangular acute. Stamens 15 in. long; anthers linear, ·05 in. long, filaments dilated. Ovary 5-6-celled; style thickened upwards, then cylindric, angled; stigma about 4-cleft. Berry 3 to ·4 in. in diam., globose, white, slightly succulent, becoming nearly dry, breaking up irregularly. Seeds very many, minute, ovoid, flattened, testa smooth. A. DC. Monog. Camp. 120, Prod. VII. 423; Clarke in Hook, f. Fl. Br. Ind. III, 436; Prain Beng. Plants I. 634. C. truncata, Endl. Gen. Pl. I. 515. Codonopsis truncata, Wall. Cat. 1301; DC. l.c. 123: Mig. Fl. Ind. Bat. II. 566. C. leucocarpa and C. celebica, Mig. l.c. II. 565, 566. C. albiflora, Griff. Notul. IV. 279. Cyclocodon lancifolium, Kurz in Flora 303; Journ. As. Soc. Beng. XLVI. 210, partly. C. truncatum, Hook. f. and Th. in Journ. Linn. Soc. II. 18. C. adnatus, Griff.; Benth. in Gen. Pl. II. 558. Campanula lancifolia, Roxb. Fl. Ind. I. 505; DC l.c. 485.

Penang: Curtis 2089. Perak: Wray 3236; Scortechini.—Distrib. India from the Sikkim Himalaya to Chittagong and Burma, Malay Islands, Southern China.

3. Pentaphragma, Wall.

Fleshy perennial herbs, with short, often rooting, little-branched stems. Leaves alternate, broad, rounded, sometimes very unequal at the base, petioles rather long. Inflorescence of axillary or lateral dense bracteate scorpioid spikes or racemes, the flowers generally in pairs between the bracts. Calyx-tube adnate to the ovary; lobes 4-5, superior, obtuse, persistent, unequal in size. Corolla campanulate, the tube short, lobes 4-5. Stamens 5 alternate with the corolla-lobes, epigynous or on the corolla tube; anthers ovate or oblong; filaments dilated, curved outwards when open. Ovary 3-5-celled; style short, cylindric; stigma large, cylindric or conical, obscurely 4-5-lobed; placentas bifid, ovules many. Fruit a more or less succulent berry, dehiscence unknown (cf. Roxb. Fl. Ind. I. 506). Seeds very many,

small, ellipsoid, testa reticulate-rugose.—DISTRIB. About 7 species, all from the Malay Archipelago and Peninsula.

Leaves markedly serrate, very unequal-sided 1. P. begoniæfolium. Leaves entire or only slightly dentate, nearly or quite equal-sided:—

1. Pentaphragma begoniæfolium, Wall. Cat. 1313. A shortstemmed fleshy herb, with flexuose rooting stems and few branches covered with crispate ferruginous woolly hairs. Leaves alternate, ovate, the base obliquely excised on one side, cordate on the other, shortly acuminate at apex, 6 to 10 in. long, 4 to 5 in. broad, coarsely serrate, sparsely crispate-villous; midrib thick, near the excised side, main-nerves 1 on the excised side, 4-5 on the other, the nerves again branching outwards; petiole 3 to 1 in. long, crispate-villous as are the nerves beneath. Inflorescence a short, 1 to 4 in. long, scorpioid, shortly peduncled spike, with 2-ranked flowers between ovate membranous bracts 25 in. long, axillary in the uppermost leaves; flowers dull yellow supported by an oblong or spathulate villous bracteole ·2 in. long, 1 in. broad. Calyx-tube adnate to the ovary, ovoid, crispate villous; lobes 5 obtuse, rounded, recurved, shorter than the tube, crispate villous without, glabrous within. Corolla white, campanulate, 5-lobed, the lobes spreading and recurved, marcescent, oblong obtuse glabrous. Stamens 5, free, 1 to 125 in. long; anthers oblong, filaments dilated at base. Ovary turbinate, 3-celled; ovules many, on axile placentas; style short, stigma cylindrically peltate, obscurely 3-lobed. Fruit a berry, dehiscence not known; seeds very many, testa prominently reticulate. DC. Prod. VII. 495; Hook. f. and Th. in Journ. Linn. Soc. II. 26; Mig. Fl. Ind. Bat. II. 568; Kurz in Journ. As. Soc. Beng. XLVI. ii. 210; Clarke in Hook. f. Fl. Br. Ind.*III. 437; Baillon Hist. des Plantes, VIII. 323, t. 152-154; Schönl. in Engl. and Pr. Nat. Pflz.—Fam. IV. 5, 60, fig. 37. Phyteuma begonifolium, Roxb. Hort. Beng. 85, Fl. Ind. I. 505; Jack in Hook. Bot. Misc. I. 276, t. 57.

Penang: Wallich 1313; Maingay 2266 (K.D. 712); Stoliczka; Deschamps; Hullett 200; Kunstler 1598. Perak: Scortechini 336 (part); Wray 3668. Singapore: Lobb.—Distrib. Mergui, Griffith. A plant of the undergrowth in dense shady forests. Ridley (Trans. Linn. Soc. III.) (1893, 315) says that it "grows on rocks along the Tahan River, and also far in the woods, in rocky valleys, common."

2. Pentaphragma Scortechinii, n. sp., King & Gamble. A

short-stemmed fleshy herb, creeping and rooting below, afterwards erect; branches flexuose, more or less crispately pilose. Leaves alternate, ovate or oblong-ovate, blunt or very shortly acuminate at apex, usually cuneately narrowed below and partly decurrent, sometimes slightly excised on one side; 4 to 10 in. long, 2 to 6 in. broad, entire or faintly dentate, margin often recurved, fleshy, glabrous or slightly rough above, crispately pilose and pale beneath; midrib very thick, sometimes slightly to one side, main-nerves about 4 pair, arched upwards and again branched; petiole thick, 2 to 3 in. long, crispately pilose. Inflorescence a short, 1 to 2 in. long, scorpioid, very shortly peduncled spike, with 2-ranked flowers between ovate obtuse bracts, axillary either singly or in pairs from the axils of upper leaves, or lateral below them; flowers white with a yellow centre, bracteole wanting. Calyx-tube adnate to the ovary, ovoid, villous without; lobes 5, ovate obtuse, unequal in size, 15 to 2 in. long, 3-nerved. Corolla campanulate, tube short; lobes 5 spreading and recurved, marcescent, glabrous. Stamens free, 05 to 1 long, recurved; anthers linear; filaments narrowly winged. Ovary turbinate, 3-celled; ovules many immersed in fleshy axile placentas; style short, stigma conical, obscurely lobed. Fruit a berry, apparently indehiscent; seeds very many, ellipsoid, papillose-reticulate.

PERAK: Scortechini 336; Wray 352, 389; King's Collector 958, 2653. Pahang: Ridley. Dense forest undergrowth in the hills at 2,000-4,000 feet, in moist places.

VAR. parvifolia, King & Gamble, a smaller more erect plant, scarcely more than 6 in. high; much less villous, the leaves smaller, oblong, obtuse or slightly acute, 4 in. long and 2 in. broad; the inflorescence shorter and the flowers smaller.

Pahang, at Salian River: Ridley. Singapore, at Bukit Timah: Ridley.

Var. flocculosa, King & Gamble, leaves ovate rotundate, thick, younger ones densely clothed beneath with crispate villous felt, margins recurved; the main-nerves rarely more than two pairs, all starting from close to the base. Inflorescence short, much curved, usually supported by a pair of rounded reduced leaves. Corolla-lobes prominently recurved. Anthers oblong, cells often divaricate.

PERAK: Scortechini. Johore, at Goonong Pulai, 1,800 feet: G. King.

This species is a very variable one, and some forms almost run into *P. begoniæ-folium*. Owing to the calyx and corolla being persistent and more or less marcescent, they vary much in size in different flowers on the same plant, and it is difficult to find characters for the varieties, one or both of which may eventually prove to be separate species.

3. Pentaphragma Ridleyi, n. sp., King & Gamble. A fleshy herbaceous plant, 10 to 12 in. in height; stem 25 in. thick, smooth, at first creeping afterwards erect. Leaves ovate, equal-sided, bluntly acute at apex, cuneate at base, 6 to 8 in. long, 3.5 to 4.5 in. broad, glabrous on both surfaces, entire or only very minutely dentate on the margin; midrib broad, main-nerves 4-5 pairs nearly straight, slanting upwards; petiole 1 in. long. Inflorescence a short, 1 to 1.5 in. long, nearly sessile spike, with 2-ranked flowers between ovate-spathulate usually 3-nerved glabrous pale bracts; each flower with a 15 in. long, linear-spathulate, 1-nerved bracteole, ciliate at tip; flowers small, ·2 to ·25 in. long, Calyx-tube adnate to the ovary; lobes 4-5, equal or unequal in size, usually 1 in. long, 3-nerved, the nerves arching. Corolla-tube short, lobes 4-5, linear-oblong, emarginate, recurved, glabrous without, minutely pubescent within, white spotted at base with purple, nerves 3. Stamens adnate at base to the corolla-tube, ·05 to ·07 in. long, anthers club-shaped, filaments dilated below. Ovary turbinate, 3-celled; ovules many on axile placentas; stigma rounded, 3-5-lobed, on a very short conical style. Fruit a berry, conical at top, apparently indehiscent; seeds rather few and large; testa beautifully reticulate.

SINGAPORE: Ridley 103.—In damp ravines at Bukit Timah (Herb. Kew).

4. SPHENOCLEA, Gaertn.

An annual erect glabrous herb, of marshy places. Leaves alternate, lanceolate, entire. Flowers in dense cylindric terminal or leaf-opposed peduncled spikes; very small, sessile, each with one bract and two bracteoles. Calyx-tube adnate to the ovary, turbinate or hemispherical; lobes 5, sub-foliaceous. Corolla campanulate, 5-lobed, valvate. Stamens 5, inserted on the base of the corolla; filaments shortly dilated; anthers short, free. Ovary semi-inferior, 2-celled; placentas axile, bearing many ovules; style short, stigma obscurely 2-lobed. Capsule semi-inferior, depresso-globose, circumsciss at the margin of the calyx-tube, the crown and calyx-lobes deciduous. Seeds very numerous, minute, oblong. A single species.

SPHENOCLEA ZEYLANICA, Gaertn. Fruct. I. 113, t. 24, fig. 5. An erect annual herb, 1 to 2 feet high. Leaves alternate, lanceolate, narrowed at both ends, 2 to 3 in. long, '25 to 1 in. broad, entire, sessile or shortly petioled, smooth, midrib and main-nerves faint. Flowers in dense, cylindric, terminal or leaf-opposed, peduncled spikes; peduncles '5 to 1 in. long; spikes '5 to 1.5 in., bract and bracteoles very small. Calyx-tube adnate to the ovary, turbinate or hemispherical, lobes 5, ovate, '05 to '06 in. long, somewhat enlarged in fruit and inflexed over

the disk. Corolla campanulate, 5-lobed, '07 to '1 in. long, greenishwhite, lobes short, rounded. Stamens 5, inserted at the base of the corolla-tube; filaments short dilated; anthers 2-celled, rounded, about as long as filaments. Ovary semi-inferior, 2-celled; placentas axile, stalked, bearing many ovules; style short, stigma obscurely 2-lobed. Capsule depressed-globose, circumsciss at the margin of the calyx-tube, the crown and calyx-lobes deciduous. Seeds very numerous, oblong, minute, scabrous; testa reticulate with rectangular cells. Wall. Cat. 1516; Roxb. Fl. Ind. I. 507, Fl. Ind. ed. Carey and Wall. II. 116; Miq. Fl. Ind. Bat. II. 569; Kurz in Journ. As. Soc. Beng. XLVI. ii. 209; Clarke in Hook. f. Fl. Br. Ind. III. 438; Trimen Fl. Ceyl. III. 519; Baillon Hist. des Plantes, VIII. 327, t. 158-161; Cooke Bomb. Flora, II. 75; Prain Beng. Plants I. 635; Schönl. in Engl. and Pr. Pfiz—Fam. IV. 5, 61, fig. 38. S. Pongatium, A. DC. Prod. VII. 548; Wight Ill. t. 138. Pongatium indicum, Lamk. Ill. II. 444; Encyc. Meth. Bot. V. 564. Gaertnera Pangati, Retz Obs. VI. 24. Rapinia herbacea, Lour. Fl. Cochinch. (ed. Willd.) I. 157. Sphenoclea, Griff. Notul. IV. 276. "Pongati," Rheede Hort. Mal. XI. 47, t. 24.

MALACCA: Griffith.—DISTRIB. Swampy places and wet fields, and along river banks in tropical regions of both hemispheres.

Order LXV. VACCINIACEÆ.

Shrubs or small trees, often epiphytic, with stems swollen at the base. Leaves alternate or in pseudo-whorls, entire dentate or serrate, evergreen, ex-stipulate. Flowers in terminal or axillary racemes, or solitary and axillary, hermaphrodite, usually regular; pedicels 1-bracteate and also often with 2 bracteoles, often articulate beneath the ovary. Calyx campanulate or cupular, the tube adherent to the ovary, its limb persistent on the fruit, usually 5-toothed. Corolla tubular (sometimes inflated), campanulate or globose, 5-toothed or 5-lobed, usually imbricate, deciduous. Stamens 10, epigynous, inserted at the base of the corolla-tube; anthers opening by apical pores, or often produced into 2 tubes, opening by slits, filaments flattened, free or connate by their bases. Ovary inferior, crowned by an epigynous disk, 5-celled or falsely 10-celled; style cylindric; stigma simple; ovules many (rarely few), the placentas axile or pendulous from the upper inner angle of each cell. Fruit baccate, rarely dry, 5- or falsely 10-celled. Seeds numerous or few (rarely only 1) in each cell, small, compressed, albuminous. Species about 350, natives chiefly of cold and temperate regions throughout the world.

Corolla long and tubular or campanulate, with long segments :-

Calyx-tube terete 1. Agapetes.

Calyx-tube 5-winged or 5-angled 2. Pentapterygium.

Corolla small, campanulate or ovoid, its lobes short .. 3. VACCINIUM.

1. AGAPETES, D. Don.

Shrubs, often epiphytic, the stems often much swollen near the base. Leaves usually coriaceous, alternate, sometimes in pseudowhorls, from linear to elliptic, entire or toothed, sessile or with short petioles, often glandular near the base. Flowers axillary, solitary, corymbose or in fascicles; the pedicel often thickened or articulate under the ovary, bracts small. Calyx globose, the limb with 5 persistent teeth or lobes. Corolla tubular or campanulate, the limb with short or long lobes, red, but often with transverse marks or with greenish-white lobes. Stamens 10, usually with short filaments; anthers oblong, each with 2 long apical processes, opening by pores or slits, often spurred behind. Disk pulvinate, often lobed. Ovary 5-celled or falsely 10-celled; style cylindric; stigma capitate; ovules numerous. Berry globose, nearly dry or succulent, 5- or 10-celled, sometimes opening by pores round the disk within the calvx-teeth. Seeds numerous, ellipsoid, testa lax.—DISTRIB. 30 species, mostly Himalayan, a few Malayan.

AGAPETES GRIFFITHII, Clarke in Hook. f. Fl. Br. Ind. III. 449. An epiphytic shrub, 3 to 15 feet long, with a tuberous stem; young branches half as thick as a goose-quill, terete, glabrous. Leaves thinly coriaceous, oblong-lanceolate to ovate-lanceolate, always caudateacuminate, the base rounded, both surfaces pale olivaceous-brown when dry, glabrous, minutely reticulate; main-nerves 5 or 6 pairs, curved, ascending, faint on both surfaces; length 3.5 to 6 in.; breadth 1 in. to 2.65 in.; petiole ·15 in. long or under. Flowers ·3 to ·4 in. long, axillary, always on slender pedicels four or five times as long as themselves, with 1 or 2 narrow bracteoles near the base, glabrous, axillary, solitary, in pairs or in lax racemes. Calyx 1 to 2 in. long (enlarging in fruit), campanulate, with 5 deep spreading triangular lobes. Corolla 25 in. long, tubular-campanulate, the mouth with 5 triangular sub-erect acute lobes. Anthers inserted at the base of the corolla-tube, linear, with 2 long apical beaks dehiscing longitudinally, and 2 posteriorlyprojecting curved spurs; filaments shorter than the anthers, hairy. Fruit globular, glabrous, crowned by the small inflexed calyx-lobes-Seeds about 20, compressed, tubercled, black.

MALACCA: Griffith. PERAK: at elevations of 2,800 to 4,000 feet, Wray 1071; King's Collector 3831, 6363, 8051; Ridley 5532; Scortechini.

2. PENTAPTERYGIUM, Klotsch.

Shrubs, often epiphytic and with stems much thickened at the base. Leaves alternate, ovate or lanceolate, sub-entire or toothed, coriaceous, often with glands at the apex of the petiole. Flowers axillary, solitary, fascicled or corymbose; the pedicels thickened near the apex, cupular and jointed under the ovary, bracts small. Calyxtube large, tubular, with 5 wings or prominent angles; its lobes 5, enlarged in fruit. Corolla tubular, the mouth with 5 short lobes, coloured red or yellow, and often transversely marked. Stamens 10, epigynous, the filaments short; anthers elliptic, produced into 2 long beaks, opening by apical pores or slits, and often spurred behind. Ovary 5-celled or spuriously 10-celled; style cylindric, often exserted; stigma sub-capitate; ovules very numerous. Fruit baccate, 5-winged or 5-ribbed, 5-celled or spuriously 10-celled. Seeds numerous, ellipsoid.—Distrib. About 6 species, natives of Eastern Himalaya, Khasia, Malay Peninsula.

Pentapterygium Scortechinii, n. sp., King & Gamble. mentose shrub, 4 to 10 feet long, growing on rocks or trees; young branches somewhat thinner than a goose-quill, terete, glabrous, pale brown when dry. Leaves thickly coriaceous, ovate to ovate-rotund, the apex blunt or sub-acute, the base broad and rounded but sometimes slightly emarginate, the edges much recurved when dry; upper surface shining, glabrous, pale olivaceous-brown; the lower darker; midrib strong, deeply depressed on the upper surface, prominent on the lower; main-nerves about 4 pairs, spreading, the two lower much the larger, all curved, mostly depressed on the upper surface and prominent on the lower; length 1.75 to 3 in.; breadth 8 to 2 in.; petioles 25 to 4 in. Flowers 1 in. long, few together, in axillary or terminal corymbs; their pedicels about 6 in. long, with 1 or more linear bracts at the base. Calyx inflated, tubular, narrowed towards the mouth, glabrous, lobes of the mouth triangular, acute, erect, the lower half of the tube attached to the ovary. Corolla inserted on the concave disk of the ovary, slightly exserted from the calyx, tubular, inflated towards the middle; lobes of the mouth short, lanceolate, reflexed; tube with rufous pubescence outside, glabrous within; style cylindric, glabrous, slightly exserted. Fruit unknown.

Perak, at elevations of about 4,500 feet: King's Collector 8152; Wray 210; Scortechini 309.

3. VACCINIUM, Linn.

Shrubs, sometimes epiphytic. Leaves usually small, alternate, but sometimes in pseudo-whorls, from lanceolate to ovate, entire or serrate.

Flowers usually small, axillary or terminal, in racemes fascicles or corymbs rarely solitary, usually bracteate and bracteolate. Calyx-tube globose, its teeth 4 or 5, small. Corolla urceolate, tubular or ovoid, 5-lobed, pink white or greenish-yellow. Stamens 8 or 10, free, inserted near the base of the corolla-tube; anthers oblong, with two apical cylindric tubes dehiscing by terminal slits, sometimes appendiculate at the base (apical tubes very short in one or two species). Disk cushion-shaped, convex, sometimes lobed. Ovary 4- or 5-celled, or falsely 8-10-celled; style cylindric; stigma simple; ovules few or several in each cell. Fruit a more or less globose berry, crowned by the persistent calyx-lobes, 5-celled or falsely 10-celled. Seeds small, 1 or more in each cell, ellipsoid, compressed; testa firm, smooth.—Distrib. Species about 140, in the Northern Hemisphere or on mountain ranges in the tropics.

Leaves broadly elliptic, ovate-rotund or oblanceolate, the apex broad, sometimes minutely apiculate but never acute, very coriaceous:—

Leaves under .75 in. in length, elliptic or obovate-elliptic; corolla 3 in. long, tapering to the mouth; a small glabrous tree or bush .. Leaves under 1 in. in length, ovate or elliptic; corolla ·2 to .25 in. long, the mouth wide, truncate; an epiphytic shrub, glabrous except the scurfy branches ... Leaves elliptic, their apices sub-obtuse, the base truncate or minutely cordate, 1 to 1.35 in. long; flowers enveloped in large deciduous bracts Leaves broadly oblanceolate or spathulate, much narrowed to the base Leaves obovate-elliptic, slightly narrowed to the apex but never acuminate, coriaceous; flowers '35 in. long, in axillary racemes . . Leaves elliptic to elliptic-oblong, sub-acute acute or acumi-

1. V. Scortechinii.

2. V. microphylla.

3. V. glabrescens.

4. V. viscifolium.

5. V. Teysmanni.

Leaves entire:-

nate:-

Leaves glabrous :-

Leaves coriaceous :-

.. 6. V. bancanum.

.. 7. V. Kunstleri.

.. 8. V. Hasseltii.

Leaves sub-coriaceous, their main-nerves 3 pairs; flowers 35 in. long; beaks of anthers more than twice as long as the cells; epiphytic ...

Leaves pubescent or puberulous beneath:—
Leaves coriaceous, oblong-lanceolate or elliptic-lanceolate, with very long caudate acuminate apices;
under surface pubescent or puberulous . . . 9. V. acuminatissimum.

Leaves serrate (sometimes faintly so) sub-coriaceous,
glabrous; flowers '3 in. long; beaks of anthers twice
as long as the cells 10. V. malaccense.

1. VACCINIUM SCORTECHINII, n. sp., King & Gamble. A small tree or large shrub; young branches rather thicker than a crow-quill. dark and much angled when dry, glabrous. Leaves small, coriaceous, elliptic or obovate-elliptic, the apex rounded, the base slightly cuneate. the edges much recurved; upper surface olivaceous-brown, shining when dry; the lower brown, dull, faintly reticulate; sparsely scaly; main-nerves a single pair, rarely 2 pairs, curving upwards, converging at their apices, faint on both surfaces; the midrib depressed on the upper surface, prominent on the lower; length 3 to 45 in.; breadth ·25 to ·35 in.: petiole very short. Flowers about ·35 in. long, solitary, axillary, their pedicels less than 1 in. long, minutely bracteate at the base, pubescent like the outside of the calvx and corolla. Calux camnanulate, the 5 teeth triangular, acute, erect. Corolla about 3 in, long, cylindric, inflated below and tapering to the mouth; the lobes short, broad, blunt, erect or reflexed. Stamens 10, each with 2 apical truncate beaks shorter than themselves, but no basal processes; filaments longer than the anthers, hairy. Ovary with a flat top, 5-celled, each cell with several ovules. Style cylindric, nearly as long as the corolla, pubescent in its lower third, otherwise glabrous. Fruit globular, crowned by the inflexed calyx-lobes, tomentose, many-seeded; seeds not compressed.

PERAK: Scortechini; Wray, at elevations of 6,000 and 6,700 feet, 888 and 356; King's Collector 8028.

By the fall of the leaves, in the axils of which they are produced, the flowers appear as if they were in racemes. This closely resembles V. buxifolium and V. coriaceum, Hook. fil., of which figures are given in Hook. Ic. Pl. t. 891 and 892, but this has much narrower flowers and broader leaves than either.

2. Vaccinium microphyllum, Blume Bijdr. 851. Epiphytic on tall trees; a small much-branched shrub; young branches as thick as a crow-quill, with small black deciduous scurf. Leaves coriaceous, ovate or elliptic, the apex and base blunt, the former sometimes with a minute apiculus; upper surface bright olivaceous and shining when dry, the lower pale-brown and dull, both faintly reticulate when dry; mainnerves usually a single pair, curving upwards from the base of the midrib and passing to near the apex a little inside the edges, depressed like the midrib on the upper surface when dry, but very faint on the lower;

length ·5 to ·75 in.; breadth ·3 to ·5 in.; petioles about ·05 in.long, hairy. Flowers ·2 to ·25 in. long, axillary, usually solitary, decurved; pedicels ·05 in.long, or less. Calyx inferior, about ·2 in. across, flat, deeply divided into 5 broadly triangular, sub-acute, spreading lobes. Corolla glabrous, widely cylindric-campanulate, deeply cut into 5 broadly triangular acute or sub-acute erect lobes. Stamens 10, from the base of the corolla; anthers oblong, each with an apical process shorter than itself but with no basal appendage; flaments shorter than the anthers, curved, expanded at the base. Ovary superior, broad with flat apex. Style cylindric, as long as the corolla; stigma capitate; ovules few in each cell. Fruit globular, surrounded by and adherent to the calyx, ·2 in. in diam. Miq. Fl. Ind. Bat. II. 1063. Diplycosia microphylla, Beccari, Malesia 212; Clarke in Hook. f. Fl. Br. Ind. III. 458.

MALACCA: Griffith (K.D.) 3484; Maingay (K.D.) 700; Lobb. Perak, at elevations of 3,000 feet: Wray 470, 1105; Scortechini 1171; King's Collector 3660, 6390. Kedah: Ridley 5528, 5529.—Distrib. Borneo, Celebes, Ternate.

3. Vaccinium glabrescens, n. sp., King & Gamble. Epiphytic; young branches rather thicker than a crow-quill, dark-coloured when dry, minutely pubescent. Leaves coriaceous, elliptic, the apex sub-obtuse, the base sub-truncate and minutely cordate; upper surface dark olivaceous-brown when dry, reticulate, smooth, shining; lower surface brown when dry, minutely pubescent like the petiole (glabrescent when old); main-nerves 3 or 4 pairs, pinnate, ascending, rather straight; length 1 to 1.35 in.; breadth .6 to 1 in.; petiole under .1 in. long. Racemes solitary, terminal, 3 or 4 times longer than the leaves, bearing at the base of each flower a large lanceolate pubescent deciduous bract .4 in. long and about .2 in. broad at the middle. Fruit sub-rotund or ellipsoid, baccate, softly and minutely pubescent, crowned by the inflexed triangular calyx-teeth, .2 in. long and .15 in. in diam., 5-celled, each cell with several angled seeds.

PERAK: Scortechini (without number).

4. Vaccinium viscifolium, n. sp., King & Gamble. Young branches half as thick as a goose-quill, striate and pale-brown when dry. Leaves very coriaceous, broadly oblanceolate or spathulate, the apex very blunt, narrowed from below the middle to the short flattened petiole, the edges slightly recurved; upper surface olivaceous when dry, the lower bright brown, both glabrous; main-nerves 2 or 3 pairs, originating from the midrib near its base, ascending, little curved, very prominent like the midrib on the upper surface but faint on the lower; length 2 to 2.75 in.; breath .8 to 1.25 in.; petioles about .1 in. Racemes terminal and axillary, often forming, from the fall of the leaves, pseudo-

panicles several times longer than the leaves. Flowers not seen. Fruit on curved deflexed peduncles, 5 in. in length, globular, baccate, 2 in. in diam., crowned by the persistent disk and by the 5 minute triangular calyx-teeth, 10-celled, the cells with more than one small angled seed.

PERAK: Scortechini 405; Wray, at an elevation of 6,700 feet,

328.

VAR. minor, King & Gamble. Leaves only 1.2 to 1.6 in. in length, their 3 or 4 pairs of nerves not so much from the base of the midrib; racemes not much longer than the leaves; fruit only 15 in. in diam.; pedicels under 2 in. long.

Perak, at elevations of 5,000 feet: Scortechini 404; King's Collector

8020.

5. Vaccinium Teysmanni, Miq. Fl. Ind. Bat. II. 1062. A mediumsized tree; young branches somewhat thinner than a goose-quill, darkcoloured and striate when dry. Leaves coriaceous, broadly obovate, often almost rotund-obovate or elliptic, rarely oblanceolate, the apex obtuse or rounded, rarely retuse or sub-acute, the base cuneate and merging in the broad, sometimes glandular petiole; both surfaces glabrous and faintly reticulate, upper olivaceous when dry, shining, the lower dark-brown, the midrib broad on both; main-nerves 4 to 6 pairs, curving upwards and anastomosing freely, more prominent on the upper than on the lower surface; length 2.5 to 3.5 in.; breadth 1.25 to 2.25 in.; petiole .2 to .4 in. long. Racemes slender, often longer than the leaves, axillary and extra-axillary, their rachises somewhat compressed and angled, often puberulous; pedicels slender, curved, minutely bracteolate or ebracteolate at the base, 15 to 2 in. long. Flowers 35 in. long: their pedicels 15 in. long, decurved or not, puberulous like the outside of the calyx. Calyx less than 1 in. long, campanulate, with 5 acutely triangular spreading teeth. Corolla white, puberulous, narrowly cylindric, tapering slightly to the mouth; lobes 5, very short, spreading or reflexed. Stamens 8 or 10, included or sub-exserted; anthers narrowly oblong, with 2 long apical spurs, but without basal appendages, shorter than the tapering hairy filaments. Ovary hemispheric, deeply grooved; style as long as the corolla, grooved; stigmas 5, very short, linear. Capsule unknown.

PERAK: On Gunong Bubu, at elevations of 4,500 feet, Scortechini 428, 443; Wray 1117, 3909; Curtis 3703.—DISTRIB. Java.

6. Vaccinium bancanum, Miq. Fl. Ind. Bat. Suppl. 587. A small tree; young branches twice as thick as a crow-quill, deciduously puberulous, pale and angled when dry. Leaves coriaceous, elliptic to elliptic-oblong, the apex sub-acute acute or acuminate, the base

cuneate; both surfaces yellowish-brown when dry and rather dull, the lower reticulate; the edges slightly recurved or not; main-nerves 4 or 5 pairs, ascending, slightly curved, faint on both surfaces; length 1 to 2.5 in.; breadth .5 to .8 in.; petioles .1 in. long. Racemes axillary and terminal, twice as long as the leaves, their rachises puberulous, angled when dry. Flowers 2 in. long; their pedicels slender, decurved, 1 to ·2 in. long, puberulous, minutely bracteolate at the base. Calyx puberulous, cupular, 15 in. across, deeply divided into 5 triangular sub-acute spreading lobes. Corolla ovoid or ovoid-globulose, with truncate, wide, entire, wavy or obscurely toothed mouth, puberulous outside. Stamens 10, shorter than the corolla and inserted at its base; anthers short, broad, with 2 short, trumpet-shaped, curved apical processes, opening by wide pores, and, at the base of these processes behind, 2 curved, slender filamentous spurs; the filaments longer than the anthers, flattened, tapering from the base upwards, pubescent. Ovary depressed, bearing a slightly convex 10-grooved disk and many hairs. Fruit ·2 to ·25 in. in diam., depressed-globular, crowned by the inflexed calyx-lobes, minutely pubescent, 5-celled; seeds numerous, triangular, reticulate, shining. Clarke in Hook. f. Fl. Br. Ind. III. 454. aristatum, Kurz in Journ. As. Soc. Beng., 1873, Pt. II. 96; 1877, Pt. II. 215; For. Fl. Burm. II. 91.

Perak, at elevations of from 5,000 to 6,500 feet: Wray 328, 1528, 3912; King's Collector 7018. Malacca: Mount Ophir, Moxon; Maingay (K.D.) 699.—DISTRIB. Bangka.

7. VACCINIUM KUNSTLERI, n. sp., King & Gamble. Epiphytic; everywhere glabrous; young branches one-third of the thickness of a goose-quill, dark and striate when dry. Leaves coriaceous, lanceolate or narrowly elliptic, the apex acuminate, the base much narrowed, the edges slightly recurved; both surfaces brown when dry, the upper tinged with olivaceous and reticulate; main-nerves 3 pairs, ascending, little curved, slightly prominent on the upper surface only; length 2 to 2.5 in.; breadth .5 to .65 in.; petioles .1 to .15 in. long. Racemes about as long as the leaves, axillary, minutely bracteolate at the base of the flowers. Flowers 2 in. long, their puberulous pedicels slender, 1 to ·15 in. long. Calyx cupular-campanulate, about ·05 in. long, the limb spreading, wavy, with indistinct broad lobes. Corolla tubular-ovoid, ·15 to ·2 in. long, the mouth with 5 broad, blunt, short recurved lobes. Stamens 10, slightly shorter than the corolla or as long; anthers small, oblong, each with 2 short, diverging, apical truncate processes, but with none at the base; filaments three times as long as the anthers, tapering, flattened and hairy below, cylindric above. Ovary 5-celled, with several ovules in each cell, depressed; disk slightly convex with radiating

grooves; style slightly exserted, hairy below; stigma small. Fruit globular. 2 in. in diam.

PERAK, on Maxwell's Hill, elevation 3,500 feet: Scortechini 39,

428; King's Collector 8415.

This closely resembles *V. bancanum*, Miq., but it is an epiphyte. Its leaves, moreover, are narrowly elliptic or lanceolate, and they have only 3 pairs of mainnerves. The flowers of this are puberulous, and the mouth of the corolla, instead of being entire, has 5 broad, short, recurved lobes. The apical processes on the anthers are also of a different shape from those in *V. bancanum*.

8. VACCINIUM HASSELTII, Mig. Ann. Mus. Lugd. Bat. I. 40. An erect shrub; young branches twice as thick as a crow-quill, darkcoloured and angled when dry, glabrous. Leaves elliptic to ellipticoblong, thinly coriaceous, glabrous, the apex acuminate (often caudately so): upper surface olivaceous-brown, the lower paler; main-nerves 3 pairs, very slightly curved and erect or ascending, the lower pairs passing almost to the apex, faint but distinct on both surfaces, some of the nerves transverse, the others vertical: length 1.5 to 2.5 in.: breadth ·6 to 1·25 in.: petioles ·2 to ·25 in. long, slender. Racemes axillary and terminal, usually slightly longer than the leaves, their rachises at first puberulous but ultimately glabrous, ebracteolate; flower-pedicels slender. curved or straight, about 15 in. long. Calyx shortly cupular, with 5 spreading, broad, sub-acute or blunt teeth. Corolla about 35 in. long. sub-cylindric, narrowing upwards to the mouth; the lobes 5, broad. blunt, erect or reflexed, very short, each bearing a small tuft of hairs. Stamens 10, as long as the corolla; anthers oblong, with 2 apical beaks more than twice as long as themselves but with no basal appendages: the filaments shorter than the beaks but longer than the anther-cells. broad and hairy at the base. Ovary much compressed, surmounted by a large, much corrugated disk; style as long as the corolla, tapering. boldly ridged. Fruit globular, smooth, glabrous, 3 in. in diam... crowned by the minute calyx-lobes. V. bancanum, Mig., var. angustifolium, Scheff.

Perak: King's Collector 7515; Derry 3702; Wray 4012. Pahang: Ridley 1363, 10895. Johore: Ridley 6316, 6323. Singapore: Ridley 3030, 6316a, 8907.—Distrib. Bangka.

9. Vaccinium acuminatissimum, Miq. Ann. Mus. Lugd. Bat. I. 36. Epiphytic shrub, 3 to 8 feet long; young branches half as thick as a goose-quill or less, clothed with short cinereous pubescence. Leaves coriaceous, oblong-lanceolate to elliptic-lanceolate, the apex caudate-acuminate, the base cuneate, the edges when dry much recurved; both surfaces dark olivaceous-brown when dry: the upper

shining, faintly and minutely reticulate, glabrous except the puberulous midrib, lower surface dull, dark cinereous-puberulous, especially on the midrib and nerves; main-nerves 4 or 5 pairs, unequal, slightly curved, ascending, the second lowest pair much larger than the others and more erect, all (like the midrib) depressed on the upper surface and bold and prominent on the lower; length 3.5 to 5 in.; breadth 1 in. to 1.75 in.; petioles .15 in. long, pubescent and with several short hispid axillary processes at their bases. Racemes axillary, shorter than the leaves, slender, pubescent; flower-pedicels .1 in. long, pubescent like the calyx, minutely bracteate at the base. Calyx when nearly ripe .15 in. in diam., with an ovoid-globular tube pubescent outside, the mouth with 5 triangular acute incurved lobes. Corolla not seen. Seeds several, compressed, black, pitted. Ericacea, Wall. Cat. 7528.

Perak, at elevations of from 5,000 to 6,000 feet: Wray 1159, 1418, 2821; Scortechini 472; King's Collector 3509, 6734, 7810. Singapore: Ridley 6235.—Distrib. Sumatra (Beccari 516), Java, Borneo.

10. VACCINIUM MALACCENSE, Wight in Calc. Journ. Nat. Hist VIII. (1847) 172. An erect shrub; all parts except the inflorescence glabrous; young branches as thick as a crow-quill, angled, brown when dry. Leaves coriaceous, lanceolate or elliptic, the apex acuminate, the base cuneate or acuminate, the edges finely crenate-serrate; both surfaces brown when dry, the lower the paler; main-nerves 4 or 5 pairs, slightly curved, ascending, interarching within the edge, not prominent on either surface; length 1 to 2.25 in.; breadth 6 to 9 in.; petioles 1 to ·15 in. long. Racemes axillary and terminal, longer than the leaves, manyflowered, puberulous like the pedicels and flowers; pedicels slender, curved downwards, 15 in. long (lengthening in fruit), each with 1 concave, lanceolate, caducous bract at its base, and 1 or 2 smaller subulate bracteoles inside it. Flowers 3 in. long. Calyx campanulate, under ·1 in. long, its lobes narrowly triangular, acuminate, spreading. Corolla ovoid-cylindric, slightly narrowed to the mouth; lobes of limb very short, reflexed. Stamens 10, shorter than the corolla; anthers with 2 apical beaks longer than themselves but with no basal processes; filaments longer than the anthers, bulbous and hairy at the base. Ovary depressed, the disk thick; style cylindric, ridged, a little shorter than the corolla. Fruit depressed-globose, glabrous, 35 in. broad. Wight Ic. 1186; Miq. Fl. Ind. Bat. Suppl. 587; Clarke in Hook. f. Fl. Br. Ind. III. 454. Epigynium malaccense, Klotzsch in Linnæa, XXIV. 50.

Malacca: Griffith (K.D.) 3458/1; Maingay (K.D.) 698; Lobb. Singapore: Ridley. Pahang: Ridley 1025. Perak: Ridley 3605.—Distrib. Bangka, Java, Cochin-China.

Order LXVI. ERICACEÆ.

Shrubs, trees, or perennial herbs. Leaves alternate or in pseudowhorls, ex-stipulate, entire or serrate. Flowers in racemes or fascicles or solitary; pedicels bracteate and sometimes bi-bracteolate. Flowers regular or (in Rhododendron) slightly irregular, hermaphrodite, sometimes dimorphous. Calyx free or (in Diplycosia) sometimes adnate to the ovary, with 5 rarely 4 or 6, teeth or lobes. Corolla hypogynous, persistent or deciduous, campanulate cylindric or urceolate, with 4 or 5 (rarely 6 to 10) imbricate or contorted, rarely valvate teeth or lobes (polypetalous in Pyrola). Stamens hypogynous or slightly attached to the base of the corolla; 10, or sometimes 5, 8, or 20 (in Diplycosia sometimes epigynous); filaments free or united into a tube by their bases; anthers 2-celled, basi- or dorsi-fixed, dehiscing by apical pores or slits, the cells often prolonged into apical tubes, sometimes dorsally spurred. Disk various, annular or convex, crenate or lobed, sometimes absent. Ovary 5-celled (rarely 4- to 16-celled); style slender, cylindric; stigma capitate or plane, entire or shortly lobed. Ovules numerous, rarely few, on placentas in the inner angles of the cells or pendulous from the upper corner. Fruit capsular, 5-celled, manyseeded, sometimes appearing baccate from the adherence of the enlarged succulent calyx. Seeds many, small, angled or compressed, albuminous; the testa often loose.—DISTRIB. About 1,200, in all parts of the world.

Fruit capsular:—		
Capsule 5-valved, loculicidal:—		
Calyx surrounding the capsule succulent in fruit:—		
Anthers with 2 horns at the apex	1	. GAULTHERIA.
Anthers not horned on the apex	2	. Diplycosia.
Calyx not succulent in fruit	3	. Pieris.
Capsule 5- to 20-celled, septicidal, calyx not succulent in fr	uit;	
anthers dehiscing by pores		. RHODODENDRON.
Fruit baccate	5	. Pernettyopsis.

1. GAULTHERIA, Linn.

Erect or procumbent shrubs, rarely epiphytic. Leaves coriaceous, persistent, alternate, serrate or serrulate, penni-nerved. Flowers small, occasionally dimorphic, in axillary or terminal racemes, or axillary and solitary, bracteate and bi-bracteolate. Calyx with 5 teeth or lobes, enlarged, succulent and coloured in fruit and enclosing the capsule, and often with 2 simple or connate bracteoles at its base. Corolla ovoid-

tubular or campanulate, greenish-white or reddish, the mouth with 5 spreading or recurved imbricate lobes. Stamens 10, included, attached to the base of the corolla; anthers produced at the apex into 2 tubes, and often also with 1 or 2 dorsal spurs; filaments dilated at the base, usually pilose (in some flowers the stamens small and the anthers without appendages). Ovary 5-celled, sometimes 5-lobed; style cylindric; stigma simple; ovules many in each cell. Capsule 5-celled, dehiseing loculicidally from the apex, enveloped in the succulent calyx; seeds many, minute, sub-globose, angled.—Distrib. Species about 80, mostly American, a few in the mountains of India and Malaya, a few also in Australia and New Zealand.

Leaves elliptic or oblong-elliptic, sub-acute .. 1. G. fragrantissima.

Leaves broadly ovate, caudate-acuminate .. 2. G. leucocarpa.

1. Gaultheria fragrantissima, Wall. in As. Research. XIII. 397, with figure. A shrub; young branches twice as thick as a crow-quill, 3-angled, glabrous, pale brown when dry. Leaves thickly coriaceous, elliptic or oblong-elliptic, sub-acute, the base cuneate, the edges crenateserrate; both surfaces pale brown when dry and dull, strongly reticulate, the upper always glabrous, the lower with sparse black scales and occasionally a few scattered hairs; length 1.5 to 2.25 in.; breadth .75 to 1.2 in.; petioles .15 to .2 in. Racemes axillary, usually longer than the leaves, slender, many-flowered; pedicels 15 in. long, deflexed, each with a small triangular acute bract at its base and two broader connate ones above its middle. Flowers 2 in long. Calyx campanulate, with 5 deep triangular lobes, puberulous, 05 in. long or less at first, persistent and increasing to 2 in. with age. Corolla 15 in. long, widely tubular, the mouth contracted and with 5 short blunt lobes. Stamens 10; anthers elongate, included, the apex with 2 deeply bifid apical horns; filaments flattened at the base. Fruit depressed-globular, with 5 deep grooves, 15 in. in diam., minutely pubescent, crowned by the long, persistent, slightly clavate, cylindric style, many-seeded. DC. Prod. VII. 593; Wall. Cat. 765; Wight Ic. 1196; Bot. Mag. t. 5984; Clarke in Hook. f. Fl. Br. Ind. III. 457. G. fragrans, Don Prod. 151. G. punctata, Blume Bijdr. 850; DC. l.c. 593; Miq. Fl. Ind. Bat. II. 1055; Kurz in Journ. As. Soc. Beng., 1877, II. 215, For. Fl. Burm. II. 92. G. ovalifolia, Wall. Cat. 1523. G. Leschenaultii, DC. l.c. 593; Wight Ill. t. 141c, and Ic. 1195. Andromeda flexuosa, Moon Cat. Pl. Cevl. 35. A. katagherensis, Hook. Ic. Pl. t. 246. Leucothoe (?) katagherensis, DC. 1.c. 606.

Perak, on the summit of Gunong Batu Patch: Wray 879, 1580; Scortechini 405 (in part).—Distrib. British India, Ceylon, Sumatra, Java.

2. GAULTHERIA LEUCOCARPA, Blume Bijdr. 856. A slender climber; young branches as thick as a crow-quill, smooth, glabrous, pale-brown when dry. Leaves thinly coriaceous, broadly ovate, shortly rather abruptly and sharply caudate-acuminate, the base broad, emarginate or sub-cordate; edges minutely crenate-serrate; upper surface olivaceousbrown when dry, much and boldly reticulate, the nerves minutely hairy; lower surface pale-brown, reticulate, glabrous; main-nerves 2 to 4 pairs, much curved, ascending, distinct on both surfaces; length 2 to 4 in.; breadth 1 to 2 in.; petioles :15 to :2 in. long. Racemes slightly supra-axillary, shorter than the leaves, their rachises compressed, glabrous or pubescent; flower-pedicels rather less than 1 in. long in flower, twice as long in fruit, each with a small ovate concave bract at its base. Flowers 3 in. long; their pedicels rather more than 1 in. long, deflexed, puberulous, ebracteolate. Calyx less than '1 in. long, puberulous, campanulate, with 5 small spreading sub-acute triangular lobes. Corolla sub-cylindric, widest at the base and gradually tapering to the mouth, teeth of the mouth very short, blunt, erect. Stamens 10; anthers linear, beaked, shorter than the densely hairy tapering fila-Ovary inferior, depressed-hemispheric, crowned by a thick, very concave, marginally grooved disk; style cylindric, tapering to the apex, glabrous. Fruit closely adnate to the calvx-tube, 5-celled, manyseeded. Miq. Fl. Ind. Bat. II. 1056; Beccari Malesia, I. 213.

Perak, at elevations of 5,000 to 6,700 feet: Wray 360, 1573, 4101; Scortechini 1348; King's Collector 8025.—Distrib. Java, Sumatra.

2. DIPLYCOSIA, Blume.

Epiphytic shrubs, glabrous or setose, evergreen. Leaves coriaceous, alternate, entire or ciliate-serrate. Flowers small, axillary, solitary, on pedicels bracteolate at the base. Calyx with 5 teeth or lobes, free or half superior, accrescent in fruit, with 2 basal bracteoles connate into a calyculus. Corolla campanulate or urceolate, with 5 slightly imbricate recurved lobes. Stamens 10, as long as the corolla, and inserted at its base, quite included or with the tips of the anthers exserted; anthers elongate, oblong, produced at the apex into two straight valvularly-dehiscing tubes, but without dorsal appendages. Disk cupular, 10-lobed. Ovary 5-celled; style filiform; stigma simple; ovules in the cells numerous, attached to axile placentas. Fruit superior or half-superior, included in the succulent accrescent calyx, 2-celled, dehiscing by 5 valves, many-seeded. Seeds minute, cuneate; testa lax, reticulate; albumen fleshy; embryo axile, cylindric.—Distrib. Species about 14, all Indian or Malayan.

Leaves 2 to 5 in. long:—				
Calyx-lobes broad, blunt		. 1.	D.	latifolia.
Calyx-lobes triangular, acute	•	. 2.	D.	heterophylla.
Leaves 1.5 to 2 in. long		. 3.	D.	eruthrina.

1. DIPLYCOSIA LATIFOLIA, Blume Bijdr. 858. A small glabrous epiphytic shrub; young branches half as thick as a goose-quill, pale and angled when dry. Leaves thickly coriaceous, elliptic, the apex shortly and obtusely acuminate, the base cuneate or somewhat rounded, the edges recurved; both surfaces pale yellowish-brown when dry, the upper shining, the lower dull; the midrib bold, much raised on the lower surface, slightly depressed on the upper; main-nerves 2 or 3 pairs, curving upwards, the lower pair usually longer than the others, none of them very prominent on either surface, but more so on the lower than on the upper, reticulations obsolete; length 3 to 5 in.; breadth 1.35 to 3 in.; petioles .2 to .3 in. long. Flowers .2 in. long, in axillary fascicles of 3 or 4; their pedicels slender, 1 to 15 in. long, inserted 3 or 4 together on minute tubercles surrounded by several small bracts. Calyx cupular, 1 in. across, with 5 broad, spreading, obtuse, ciliolate lobes. Corolla 25 in. long, narrowly campanulate, contracted into a short tube at the base, the limb deeply divided into 5 ovate sub-acute lobes, closely embracing the ovary. Stamens 10, included; anthers narrowly oblong, each with two short apical truncate beaks but no basal processes; the filaments slender in their upper halves, the lower halves dilated and cohering into a tube. Ovary 5-celled, the apex broad, concave; style cylindric, about as long as the corolla; stigma small, capitate. Fruit 5-celled; seeds numerous, elongate, black, closely enveloped by the persistent corolla. Miq. Fl. Ind. Bat. II. 1055.

Perak, at elevations of 6,700 feet: Wray 364, 909, 2204; Scortechini 339; King's Collector 6797, 8023. Selangor: Ridley 7556.—Distrib. Java.

2. Diplycosia heterophylla, Blume Bijdr. 858. A shrub; young branches as thick as a crow-quill, coarsely rusty-pilose at first, afterwards sub-glabrous, when dry pale and angled. Leaves coriaceous, elliptic oblong-elliptic or lanceolate, acute or acuminate at apex and base, the edges recurved; both surfaces olivaceous-brown when dry, the upper sub-reticulate and shining, the lower dull and not reticulate; main-nerves 1 pair following the edge from base to apex, distinct and depressed like the midrib on the upper surface, indistinct on the lower; length 2 to 4 in.; breadth 1 to 2 in.; petiole rather more than 2 in. long. Flowers axillary, fascicled, rarely solitary, about 15 in. long, bearing under the calyx 2 broadly reniform, acute, spreading concave bracts.

Calyx campanulate, with 5 broadly triangular erect lobes, closely applied to the fruit. Corolla widely campanulate, 2 in. long, the teeth 5, broad, blunt, short, reflexed. Fruit superior, sub-rotund, smooth, many-seeded, crowned by the fluted style; seeds oblong, concave, compressed, numerous.

PERAK: Scortechini.

3. DIPLYCOSIA ERYTHRINA, King & Gamble. A small tree, 10 to 20 feet high; young branches twice as thick as a crow-quill, glabrous, pale-brown when dry, angled. Leaves thickly coriaceous, elliptic, the apex obtuse or sub-acute, the base acute, the edges recurved; both surfaces when dry pale-brown, the upper tinged with olivaceous, not reticulate, quite glabrous: main-nerves 2 to 3 pairs, ascending, rather straight, faint on both surfaces; length 1.5 to 2 in.; breadth .75 to 1 in.; petioles 1 in long stout. Racemes terminal, nearly twice as long as the leaves, with a large narrowly elliptic leaf-like bract '4 to '6 in. long, and ·1 to ·2 in, broad at the base of each flower-pedicel; pedicels decurved, ·15 in, long in the flower, rather more than twice as long in the fruit. Flowers 4 in, long, Calux 2 in, long, campanulate, with 5 spreading triangular acute lobes. Corolla :35 in, long, cylindric, narrowed towards the throat, glabrous; the mouth with 5 short, broad, blunt, recurved lobes. Stamens 10, slightly exserted; anthers broadly oblong, with neither apical nor basal appendages; the filaments three times as long. broadening towards the base, pubescent. Ovary inferior, its disk convex, hairy; style slightly exceeding the corolla, cylindric; stigma small. capitate. Fruit oblong-globose, 2 in. in diam., surmounted by the inflexed calvx-lobes, sub-glabrous, pericarp leathery; cells 5, each with several angular seeds. Vaccinium erythrinum, Hook, Bot. Mag. t. 4688.

PERAK, at elevations of 5,000 feet: Wray 3816; King's Collector 7349; Scortechini.—DISTRIB. Java, Sumatra.

3. Pieris, D. Don.

Trees or shrubs, with terete branchlets. Leaves alternate, petiolate, entire or serrulate, persistent. Racemes axillary and solitary, or terminal and in panicles; pedicels bracteate and also with 1 or 2 bracteoles. Calyx free, with 5 teeth or lobes; the segments in bud open or valvate. Corolla ovoid or elongate-urceolate, with 5 short recurved teeth, white. Stamens 10; anther-cells ovoid-truncate; filaments each with 2 divaricate horns from its apex or ex-appendiculate. Ovary globose with a lobed disk, 5-celled; ovules numerous; style cylindric; stigma capitellate or truncate. Capsule globose, dry, 5-celled, with 5-valved loculicidal dehiscence. Seeds many, linear-oblong, falcate, not

winged, albuminous; testa loose.—DISTRIB. Species 10; Himalaya and the mountains of Burma and of the Malayan Peninsula.

PIERIS OVALIFOLIA, D. Don in Edinb. Phil. Journ. XVII. (1834) 159. A tree; young branches whitish-puberulous at first afterwards black and glabrous, about a third as thick as a goose-quill. Leaves thinly coriaceous, ovate, shortly acuminate, the base broad and rounded. the edges very slightly recurved; upper surface blackish-brown when dry, glabrous, the lower of a paler brown, minutely reticulate, puberulous on the midrib and nerves; main-nerves 12 to 15 pairs, spreading, curving slightly upwards, sharply prominent on the lower surface, indistinct on the upper; length 4 to 5.25 in.; breadth 2 to 2.75 in.; petiole 25 to 3 in. long, puberulous. Racemes simple, axillary, 4 to 10 in. long, sometimes by suppression of the leaves forming a terminal false panicle, more or less pubescent; bracts 2 in. long, linear or lanceolate. Calyx-teeth connate at the base. Corolla narrowly ovoid, white. Capsule globose, glabrous, 2 in. in diam. Seeds small, linearoblong. DC. Prod. VII. 599; Loudon, Arb. Brit. 570, fig. 1070; Clarke in Hook. f. Fl. Br. Ind. III. 460. Andromeda ovalifolia, Wall. Cat. 763, and in Asiat. Research, XIII. 391 (with fig.); Don Prod. 148; Wight Ic. t. 1199; Brandis For. Flora, 280; Kurz in Journ. As. Soc. Beng., 1877, Pt. II. 216, For. Fl. Burm. II. 192. A. elliptica, Sieb. & Zucc. Fl. Jap. Fam. Nat. II. 126. Thibaudia, Griff. Ic. Pl. Asiat. t. 514.

Perak, at an elevation of 5,000 feet: Wray 1522.—DISTRIB. Himalaya up to 8,000 ft.; Khasia Hills; Burma; Japan.

4. Rhododendron, Linn.

Shrubs or trees, often aromatic often scaly. Leaves coriaceous, entire, alternate, rarely sub-opposite or in false whorls, often clustered near the ends of the branches. Flowers in terminal fascicles or pseudocorymbs, rarely solitary or axillary; bracts broad, usually caducous, bracteoles linear. Calyx persistent, 5-lobed, rarely cupular, sometimes small or obsolete. Corolla campanulate, salver-shaped or funnel-shaped, the tube long or short, the limb 5- to 10-lobed. Stamens usually 10 but sometimes 5 or 18; anthers oblong, dehiscing by terminal pores. Ovary 5- to 20-celled; style long or short, filiform; stigma capitate; ovules numerous in each cell. Capsule short or elongate, always woody, 5- to 20-celled, septicidally dehiscent, the valves separating from the placentas from above downwards. Seeds numerous, ellipsoid, albuminous, the testa often crested or tailed at one end or at both.—Distrib. Species about 160, in mountainous parts of Europe, Asia, and North America.

Lower surfaces of leaves glaucous, the nerves and reticulations hairy; capsule 5 in. long 2	R. javanicum. R. Wrayi.
capsule 1 to 1.5 in. long I. Lower surfaces of leaves glaucous, the nerves and reticulations hairy; capsule 5 in. long 2	
Lower surfaces of leaves glaucous, the nerves and reticulations hairy; capsule 5 in. long 2	
tions hairy; capsule 5 in. long 2	R. Wrayi.
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Corolla narrowly campanulate or funnel-shaped, the tube	
inflated upwards and passing gradually into the limb; flowers	
-35 to ·85 in. long:—	
Leaves obovate, 6 to 8 in., and rarely as much as 1 in. long:-	
	. R. pauciflorum.
	. R. perakense.
Leaves elliptic to elliptic-rotund, from 1.25 to 2 in. long 5	. R. Scortechinii.
Corolla salver-shaped, the tube much longer than the limb:—	
Tube of corolla from 1.25 to 1.6 in. long, and about .15 in. in	
diam. from base to apex; leaves sub-sessile, whorled, sparsely	
scaly or glabrous 6	. R. jasministorum.
Tube of corolla 2 in. long, 25 in. wide near the base, widen-	
ing to $\cdot 4$ in. or more near the mouth; petioles $\cdot 35$ to $\cdot 5$ in. long 7	. R. longiflorum.
Tube of corolla ·6 in. long and about ·2 in. in diam.; petioles	
·4 to ·6 in. long 8	. R. malayanum.

Species imperfectly known

9. R. dubium.

1. Rhododendron Javanicum, Benn. Pl. Jav. Rar. p. 85, t. 19. An epiphytic shrub, 3 to 8 feet long; all parts glabrous, esquamose; young branches rather thinner than a goose-quill. Leaves thinly coriaceous, elliptic or elliptic-oblong, tapering to the acute apex and base; both surfaces brown when dry (the lower rather the lighter), shining, the midrib very prominent; main-nerves about 8 or 10 pairs, interarching rather far from the edge, faint on the upper surface, obsolete on the lower, the intermediate nerves almost as prominent; length 3.5 to 5.5 in.; breadth 1.25 to 2 in.; petioles 3 to 75 in. long. Umbels terminal, 5- to 7-flowered, enveloped in bud in broadly ovate apiculate bracts: pedicels 5 to 15 in.; bracteoles linear. Calyx cupular, less than 1 in. deep, the mouth wavy. Corolla red, widely campanulate, 1.25 to 1.5 in. long; the tube widely funnel-shaped, cylindric at the base; the limb 1.25 to 1.5 in. wide, with 5 large, broad, blunt spreading lobes. Stamens 10, shorter than the corolla-limb; the filaments slender; the anthers oblong. Ovary glabrous or slightly scaly (hairy in var. Teysmanni); style shorter than the stamens, clavate, hemispheric. Capsule narrowly cylindric, 1 to 1.5 in. long, and only 25 in. in diam., glabrous, slightly ridged, crowned by the whole or part of the style. DC. Prod. VII. 721; Bot. Mag. t. 4366; Fl. des Serres (1847), t. 293; Mig. Fl. Ind. Bat. II. 1057; Miq. in Ann. Mus. Lugd. Bat. I. 42, t. 1B; Clarke in Hook. f. Fl. Br. Ind. III. 463. Vireya javanica, Blume Bijdr. II. 854. MALAY PENINSULA: Lobb and others. Penang: Ridley 129. Kedah: Derry 5531. Perak: Scortechini 373, 1325; Derry 3705; Fox 129; King's Collector 2335, 3672, 6916, 7008; Wray 1023. Singapore: Ridley.—Distrib. Sumatra, Java, Celebes.

Var. Teysmanni, King & Gamble. Ovary densely hairy; filaments hairy near the base, corolla yellow. R. Teysmanni, Miq. Fl. Ind. Bat. Suppl. 585; Clarke in Hook. f. Fl. Br. Ind. III. 463.

Penang: Maingay (K.D.) 1099, 10257; Curtis 530. Perak: Wray 601, 623; King's Collector 3672.—Distrib. Sumatra, Java.

2. RHODODENDRON WRAYI, n. sp., King & Gamble. young branches as thick as a goose-quill, at first sparsely scaly, ultimately glabrous. Leaves very coriaceous, elliptic or sub-obovate-elliptic, the apex sub-acute, the base rounded, the edges recurved when dry; upper surface dark-brown when dry, glabrous, the midrib much depressed; lower surface white, glaucous, with short hairs on the minute reticulations, the main-nerves, and the bold midrib; mainnerves 6 to 12 pairs, spreading, curved, rather dark-coloured and conspicuous on the lower surface, invisible on the upper; length 1.75 to 3.5 in.; breadth .85 to 1.5 in.; petioles .4 to .8 in. long, stout, scaly. Umbels terminal, 8- to 12-flowered, unequal, 5 to 75 in. long, scaly. Flower-buds enveloped in obovate-oblong apiculate bracts, the inner tomentose externally, the outer glabrous, all deciduous. cupular, 5-toothed, less than 1 in. deep. Corolla glabrous, white, tinged with pale pink and spotted in the throat, widely campanulate from a tubular base, about 1.25 in. long, and rather more in breadth at the mouth; lobes of the limb 5, broadly ovate, spreading. Stamens 10; filaments shorter than the corolla, glabrous; anthers oblong. Ovary hairy; style glabrous, longer than the stamens; stigma hemispheric, lobed. Capsule only 5 in. long and about half as much in diam., not apiculate, tomentose, ridged, 5-celled.

Perak, at from 3,500 to 7,000 feet: Wray 322, 886, 1569; Scortechini.

3. Rhododendron pauciflorum, n. sp., King & Gamble. A small shrub, all parts except the inflorescence glabrous; young branches as thick as a crow-quill, smooth. Leaves coriaceous, obovate, rarely rotund-obovate, the apex broad, usually minutely retuse, the base much narrowed, the edges recurved; upper surface olivaceous, the lower brown when dry; the midrib stout and prominent on the lower surface, depressed on the upper (when dry); main-nerves 3 or 4 pairs, indistinct on both surfaces; length 6 to 1 in.; breadth 4 to 65 in.; petioles less than 1 in. long. Flowers 1 or 2, terminal; their pedicels pubescent, 25 to 6 in. long, with 1 or 2 loose sheathing deciduous bracts at their bases. Calyx cupular, about 1 in. long, obscurely toothed. Corolla

bright red, infundibuliform-campanulate, 2 to 3 in. wide at the throat and from 5 to 85 in. long; the limb spreading, 5 to 75 in. across, divided into 5, broad, blunt lobes, the tube 35 to 5 in. long. Capsule unknown.

Perak, on Gunong Batu Patch at an elevation of 4,500 feet: Wray

231; Scortechini 345B.

4. RHODODENDRON PERAKENSE, n. sp., King & Gamble. Epiphytic; a small shrub with very scaly young branches as thick as a crow-quill. Leaves very coriaceous, obovate or broadly oblanceolate, obtuse, much narrowed to the base, the edges recurved; upper surface olivaceous when dry, at first with a few large scales but ultimately glabrous, reticulate, the midrib depressed; lower surface dark brown, with persistent large dark scales in pits, the midrib very thick and prominent; main-nerves 2 (rarely 3) pairs, spreading, very prominent on the under surface, and, like the midrib, with persistent large dark scales; length 6 to 8 in.; breadth 3 to 4 in.; petioles about 1 in. long. Umbels terminal, 3- to 5-flowered, covered in bud by broad rounded deciduous bracts with ciliate edges; pedicels 25 to 3 in. long, slightly scaly. Flowers :35 to :4 in. long. Calyx shallow, cupular, its edges wavy. Corolla bright yellow, narrowly campanulate, the mouth with broad, slightly spreading lobes. Stamens not exserted; filaments Ovary sub-glabrous; style not exserted; glabrous, anthers short. stigma clavate, truncate. Capsule 3 in. long, dehiscing by 5 straight untwisted valves.

Perak, at an elevation of 7,000 feet: Wray 1574.

5. Rhododendron Scortechinii, n. sp., King & Gamble. Shrubby, epiphytic or terrestrial, when the latter sometimes sub-arboreous; young branches half as thick as a goose-quill, smooth, terete. Leaves very coriaceous, elliptic to elliptic-rotund or obovate, the apex obtuse and sometimes faintly notched, the base cuneate, the edges recurved; upper surface dark olivaceous-brown when dry, glabrous, shining, depressed-reticulate; lower surface of a uniform warm brown, not reticulate, pitted and minutely scaly; main-nerves 4 to 6 pairs, spreading, depressed on the upper surface, and raised on the lower (sometimes very much so); midrib much depressed on the upper surface and prominent on the lower (when dry); length 1.25 to 2 in.; breadth -75 to 1.25 in.; petioles 1 to 15 in. long, scaly. Umbels terminal, 4- to 7-flowered; the pedicels unequal, 5 to 1 in. long (longer in fruit). Flowers about 75 in. long. Calyx short, cupular, with many rounded Corolla yellow (sometimes very pale), 75 in. long, widely funnel-shaped, the mouth about 6 in. across, with 5 deep, broadly ovate, slightly spreading lobes, the outer surface with many darkcoloured scales. Stamens about 8, slightly or not at all exserted; filaments glabrous; anthers elliptic, small. Ovary scaly; style slightly exserted, glabrous; stigma clavate-hemispheric, lobed. Capsule 5 in. long, scaly, shortly apiculate, 5-valved, the valves not twisted in dehiscence.

Perak, at elevations of 5,000 to 7,000 feet: Scortechini 401B, 753; Wray 311, 1572, 3840; Cantley.

6. Rhododendron Jasminiflorum, Hook. Bot. Mag. t. 4524. Usually epiphytic; a small shrub, only a few feet high; young branches somewhat less than half as thick as a goose-quill, glabrous. Leaves in whorls, thickly coriaceous, almost sessile, broadly elliptic to elliptic-rotund, the apex acute, the base rounded and minutely cordate: upper surface when dry pale olivaceous-brown, sometimes with a few small loose scales, the 5 to 7 pairs of spreading main-nerves slightly distinct and (like the midrib) depressed; the lower darker brown, not olivaceous, the nerves very faint but the midrib pale and prominent; length 1.25 to 3 in.; breadth 1 to 1.5 in.; petiole 1 in. long. Umbels terminal, 8- to 20-flowered; the pedicels filiform, .75 to 1 in. long, scaly and hairy; bracteoles membranous, broad, glabrous, .25 to .5 in. long. Calyx a shallow toothed cup, less than 1 in. deep. Corolla white, salver-shaped; the tube narrowly cylindric, sparsely scaly or glabrous outside, about 15 in. in diam. and 1.25 to 1.6 in. long (when dry); the limb one-third as long, spreading, with 5 deep, broad, obovate-obtuse or rotund lobes. Stamens 10, the filaments shortly exserted, thin, pubescent; anthers short, broad. Ovary 5-celled, pubescent; style longer than the corolla-tube, pubescent; stigma depressed-capitate, grooved. Capsule about .75 to 1 in. long, narrowly sub-cylindric, much apiculate, ridged, its valves recurved to the base and often twisted. Lemaire, Jard Fleur. t. 41; Illust. Hortic. (1859) t. 203; Clarke in Hook, f. Fl. Br. Ind. III. 463; Miq. Fl. Ind. Bat. II. 1059.

Malacca, on Mount Ophir: Griffith (K.D.) 3504; Maingay (K.D.) 701; Ridley. Perak: Wray 1635; Scortechini; King's Collector 3586, 3645, 6909; Ridley 124.—Distrib. Java, Sumatra.

7. Rhododendron longiflorum, Lindl. in Journ. Hort. Soc. III. 88 with figure. Epiphytic; 3 to 6 feet high; young branches half as thick as a goose-quill, densely scaly like the petioles. Leaves coriaceous, usually elliptic-oblong, sometimes elliptic or oblanceolate, sub-acute or acute, much narrowed to the base; upper surface when dry olivaceous-brown, coarsely and widely reticulate with broad black scales, especially on the depressed midrib, the 5 to 7 pairs of spreading main-nerves faint; lower surface brown, uniformly covered with black deciduous scales, ultimately glabrous; the main-nerves indistinct but the midrib

stout and prominent; length 2.25 to 3.5 in.; breadth ·8 to 1.5 in.; petioles ·35 to ·5 in. long, stout. Umbels terminal, 5- to 7-flowered; flower-pedicels ·5 to ·8 in. long, scaly or glabrous. Flowers about 2 in. long, glabrous outside, narrowly sub-campanulate, almost salver-shaped. Calyx small, cupular, with wavy edges, under ·05 in. deep. Corolla red, infundibuliform; its tube about ·25 in. wide near the base but expanding gradually to about ·4 in. or more near the mouth, about three times as long as the broadly bluntly 5-lobed limb. Stamens 10, the filaments slender, pubescent, slightly exserted; anthers short, blunt. Ovary densely hairy like the style; stigma clavate. Capsule unknown. Fl. des Serres, V. p. 477–480F.

Perak: Scortechini 385, 553, 1409; King's Collector 1864, 5181.— Distrib. Borneo, Sumatra.

8. Rhododendron Malayanum, Jack in Mal. Misc. II. n. 7, 17. An erect straggling shrub, 3 to 15 feet high, all parts more or less glandular and scaly; young branches less than half as thick as a goosequill. Leaves narrowly elliptic or lanceolate, the apex and base acute or sub-acute, the edges recurved when dry; upper surface shining, glabrous, and olivaceous when dry, the 5 to 8 pairs of main-nerves faint, slightly depressed, the midrib much depressed and often scaly; the lower of a deep uniform brownish-cinereous colour and with numerous dark scales, the nerves obsolete but the midrib bold and prominent: length 1.75 to 3.25 in.; breadth .75 to 1.25 in.; petioles .4 to -6 in. long, covered with large black scales. Umbels terminal, 3- to 5flowered. Flowers ·8 in. long, their pedicels ·25 to ·35 in. long, slender, scalv. Calyx cupular, 5-toothed, less than '05 in. deep. Corolla red, glabrous, 8 in. long (when dry), salver-shaped, the tube about 2 in. in diam. when dry, about 6 in. long, the limb about 5 in. across when dry, with 5 broad, blunt, cuneate lobes. Stamens 10, their filaments glabrous. Ovary 5-celled; style slightly exserted from the throat of the corolla, glabrous; stigma clavate. Capsule about 1 in. long, slender. ridged, the valves much recurved, twisted. Hook. Journ. Bot. I. 369; DC. Prod. VII. 725; Bot. Mag. t. 6045; Beccari Malesia, I. 205; Clarke in Hook. f. Fl. Br. Ind. III. 463. R. tubiflorum and R. celebicum, DC. l.c. 725; Miq. in Ann. Mus. Lugd. Bat. I. 44, t. 2AB; Fl. Ind. Bat. II. 1059. R. lampongum, Miq. Fl. Ind. Bat. Suppl. 585. Vireya tubiflora and V. celebica, Blume Bijdr. 855, 854.

Malacca: on Mount Ophir, 4,000 ft., Griffith (K.D.) 3503; Maingay (K.D.) 702; Wray; Kurz. Perak: Scortechini 385, 2336; Wray 614; King's Collector 3227, 8076. Penang: Ridley 125. Selangor: Ridley 7557.—Distrib. Sumatra, Java.

^{9.} Rhododendron dubium, n. sp., King & Gamble. A shrub or small

tree; young branches rather thinner than a goose-quill, pale brown when dry, slightly pubescent. Leaves coriaceous, glabrous, oblong-elliptic, the apex sub-acute, narrowed from about the middle to the acute or rounded base; both surfaces dull brown when dry and minutely reticulate, the lower pale; main-nerves 15 to 18 pairs, slightly curved, spreading, indistinct on the upper surface, rather distinct on the lower; the midrib very bold and prominent on the lower surface, faint and depressed on the upper; length 3.5 to 6 in.; breadth 1 to 2 in.; petiole .75 to 1 in. long, stout. Umbels shortly stalked, 3- to 8-flowered; flower-pedicels unequal, .75 to 1.35 in. long, stout, glabrous. Flowers unknown. Calyx cupular, 1 in. deep, the mouth wavy. Ovary densely rufescent-pubescent. Capsule .4 to .7 in. long, rusty-pubescent, very slightly ridged, dehiseing by 5 straight valves, crowned by the persistent pubescent style.

PERAK, at an elevation of 3,400 feet: Wray 233, 460: Scortechini 367.

5. Pernettyopsis, King & Gamble, nov. gen.

Small rigid epiphytic shrubs. Leaves alternate, on short hispid petioles, minutely sub-crenulate, coriaceous, persistent. Flowers solitary or in pairs, axillary, with 2 (rarely 3) rather large bracts at their bases forming an involucre; pedicels decurved in fruit. Calyx larger than the corolla, rotate, deeply 5-partite, persistent and unchanged in fruit. Corolla urceolate or ovoid, glabrous, the mouth constricted and with 5 short reflexed teeth. Stamens 10, free, included, the filaments slightly attached by their somewhat dilated bases to the bottom of the corolla-tube. Anthers short, inappendiculate at the back or base, oblong, the apices prolonged into 2 long porously dehiscing tubes. Ovary faintly 5-lobed, 5-celled; style columnar; stigma simple; ovules numerous, the placentas on the inner angles of the loculi. Berry globose, 5-celled. Seeds minute, compressed, numerous, angled; testa crustaceous.—Distrib. Species 2, both Malayan.

1. Pernettyopsis malayana, n. sp., King & Gamble. Epiphytic; a bush a foot or two in height; young branches half as thick as a goose-quill, sparsely clothed near their apices with flat adpressed black bristles less than 1 in. long. Leaves thickly coriaceous, rotund, obovate to elliptic, the apex broad, minutely apiculate, the base slightly narrowed; upper surface olivaceous-brown when dry, shining, the midrib and main-nerves deeply depressed, the reticulations less so; lower

surface pale dull-brown, with sparse pits, each bearing a short adpressed dark hair, the edges wavv. sub-serrate and adpressed-ciliate; mainnerves 2 or 3 pairs, curving upwards and inwards and interarching. thick but faint on the lower surface; length 1.25 to 2 in.; breadth 75 to 1.35 in.; petioles 1 to 2 in., adpressed-bristly. Flowers solitary or in pairs, 4 or 5 in. long, axillary, pedicellate, the pedicels 3 to 4 in. long, twice as long (or more) in fruit, densely rustvtomentose and recurved when young, erect and less woolly when old. Involucial bracts usually 2, thick, about 2 in. long, broad, glabrous inside, rusty-tomentose outside. Calux larger than corolla, rotate. deeply divided into 5 lanceolate, somewhat spreading, lobes; rustvtomentose outside and sub-glabrous inside. Corolla a little shorter than the calvx, glabrous, ovoid-globular, its mouth contracted and with 5 short reflexed teeth. Stamens 10, shorter than the corolla, and inserted near its base; anthers oblong, broad, cordate and inappendiculate at the base; the apex prolonged into 2 white apically porous tubes; filaments short, bent. Ovary sub-globular, laxly and deciduously tomentose, 5-celled; ovules numerous, oblong-concave, attached by the middle to the axillary placentas; style cylindric, slightly grooved, twice as long as the corolla. Fruit a berry with scanty pulp, blue when ripe, the seeds red.

PERAK, at elevations of about 6,500 feet, on the summit of Gunong Batu Pateh: Scortechini 402; Wray 312.

2. Pernettyopsis sub-glabra, n. sp., King & Gamble. A small, rigid, epiphytic shrub; young stems slightly thicker than a crow-quill, with a few adpressed bristles near the ends, otherwise glabrous. Leaves coriaceous, sub-rotund to elliptic-rotund, minutely apiculate; upper surface dull-brown, minutely reticulate, glabrous, the lower reddish-brown, with a few small adpressed hairs with black bases; main-nerves 3 or 4 pairs, curving upwards, deeply depressed on the upper surface like the midrib, less so on the lower; the edges minutely sub-serrate and sparsely adpressed-ciliate; length ·8 to 1·5 in.; breadth ·75 to 1·25 in.; petiole ·15 to ·25 in. long, adpressed-bristly. Bracts under the flower 2 or 3, broad, rusty-pubescent externally like the pedicel. Calyx longer than the corolla, rotate, with 5 deep lanceolate spreading lobes, glabrous except the rusty-pubescent tips. Corolla, stamens, ovary, and style as in P. malayana. Fruit unknown.

PERAK, at elevations of 5,000 feet: Scortechini 752; King's Collector 7407.

Order LXVII. MONOTROPEÆ

[By D. PRAIN.]

Leafless, erect, white or coloured root-parasites; stems herbaceous, scaly, simple or forked. Flowers solitary on the stem or branches, regular, hermaphrodite. Sepals usually resembling the scales, 2 to 6, often deciduous. Petals 3 to 6. Stamens 6 to 12, hypogynous, 2-seriate; filaments filiform or flattened; anthers 2-celled, or by confluence 1-celled. Ovary superior, globose or fusiform, 1- to 6-celled; style cylindric, stigma peltate; ovules very many on axial or parietal placentas. Fruit capsular, loculicidally 4- to 6-valved, or indehiscent and baccate. Seeds very many, minute; testa often loosely saccate; embryo very minute, solid.—Distrib. Genera 9, in dense woods, mostly in temperate regions, all in the northern hemisphere.

1. CHEILOTHECA, Hook. fil.

Small herbs, with erect, simple or forked, white or coloured stems; branches 1-flowered. Sepals 3 to 5, narrowly oblong like the uppermost stem-scales. Petals 3, erect, obtuse. Stamens 6; anthers linear, cells 2, confluent at the apex, dehiscing by marginal slits or pores. Ovary fusiform, 1-celled, narrowed into the cylindric style; stigma globose-conic, usually slightly lobed; placentas 6, parietal, 2-fid, the segments covered throughout by numerous ovules. Fruit fleshy, indehiscent, baccate.—Distrib. Species 2, Indo-Chinese and Malayan.

1. CHEILOTHECA MALAYANA, Scort. in Hook. fil. Icon. Plant., XVI. t. 1564. A root-parasite in dense forest; stem herbaceous, erect, simple or 2- to 3-forked, 6 to 9 in. high, stoutish. Scales ovate-oblong, obtuse, imbricated, gradually increasing upwards, lurid purple (Scortechini) or waxy white (Kunstler). Flowers terminal on stem and branches, 1 in. long, hidden inside the uppermost scales, and bright yellow (Kunstler), or with the tips of the petals exserted and white (Scortechini). Sepals 5, resembling the uppermost scales, imbricate, linear-oblong, obtuse or sub-acute, glabrous. Petals 3, rather larger than the sepals, rounded-cucullate at the apex, externally glabrous, internally more or less pilose. Stamens 6, filaments puberulous or pilose, alternately somewhat shorter and longer; anthers short, innate, hippocrepiform, cells confluent at apex, dehiscing by marginal pores. Ovary narrowly fusiform; stigma obscurely 4-lobed; placentas 6, parietal. Fruit white, fleshy, baccate, '75 in. across, tipped by the persistent remains of the stout style. Prain in Journ. As. Soc. Beng. LXXIII. 2, 205.

Perak, in heavy jungle at about 3,500 feet elevation: Scortechini; Kunstler 2715.

According to the field notes recorded by these two careful collectors the specimens gathered by Kunstler differ from those obtained by Scortechini; in the latter the scales were lurid purple and the flowers were white, in the former the scales were waxy white and the flowers bright yellow. The petals in Kunstler's plant are sparingly hirsute within and the anthers are nearly twice as long. In other respects, however, the two plants are identical, and the doubt that one feels in connection with the two is not so much as to whether they are conspecific, as it is as to whether this Malayan Cheilotheca be really specifically separable from the species from the Khasia Hills upon which Hooker originally based the very distinct genus Cheilotheca. The only very tangible differences are that in the Khasia plant only 3 to 4 scales can be with propriety considered sepals, whereas in the Malayan one the number of sepals, as apart from the upper scales or bracts, is 5; and that in the Khasia plant the anthers are long, like linear lips on each side of the connective, whereas in the Malayan plant the anthers are much shorter and distinctly hippocrepiform. The fruit appears to be quite indehiscent, and thus deviates from the fruit in other genera of Monotropeæ, which, so far as is known, is always loculicidally dehiscent.

Order LXVIII. EPACRIDEÆ.

Shrubs or small trees. Leaves alternate, rarely sub-opposite or pseudo-verticillate, articulated with the branches, sometimes fascicled or imbricate, coriaceous or rigid, persistent, entire, with parallel longitudinal nerves; ex-stipulate. Flowers hermaphrodite, solitary and axillary or terminal, spicate or racemose, generally white or red; usually bracteate and usually 2-bracteolate, the bracteoles similar to the sepals. Calyx 4- to 5-partite, the segments coriaceous, striate, imbricate, persistent. Corolla 4- to 5-fid, monopetalous, deciduous or sometimes marcescent; the tube short or long, often cylindric or funnel-shaped; the lobes short or long, erect, patent or recurved, imbricate or valvate, persistent. Stamens 5, rarely 4, hypogynous or epipetalous, the filaments short or long, filiform or flattened, free; the anthers dorsifixed, oblong, dehiscing along their whole length by a single slit, 1-celled or spuriously 2-celled. Disk cupular, annular or of simple or bifid scales equal in number to the carpels. Ovary globose or ovoid, 1- to 10celled; style terminal, short or long, filiform; stigmas punctiform, discoid or lobulate, sometimes annular or indusiate; ovules in each cell solitary, pendulous, rarely erect; or many on a central placenta. Fruit drupaceous, with 2 to 5 1-seeded pyrenes; or a many-seeded capsule. Seeds small, with fleshy albumen, testa membranaceous; embryo axile, orthotropous, smooth; cotyledons short; radicle elongate, near the hilum.—Distrib. About 320 species, nearly all Australian, a few in

New Caledonia and New Zealand, the Pacific Islands, or the Malay Archipelago.

LEUCOPOGON, Br.

Shrubs, erect or prostrate, branching, rarely trees. Leaves various, sessile or petiolate, striate-nerved. Flowers small, white, in axillary or terminal spikes or racemes, the rachis ending in an imperfect flower; bract 1, bracteoles 2 to 3 under the calyx. Calyx 5-partite. Corollatube funnel-shaped or campanulate; lobes 5, valvate in bud, patent or upper part recurved, hairy within. Stamens fixed to the top of the corolla-tube, filaments short, filiform; anthers dorsifixed, included or semi-exsert, linear or oblong. Ovary 2- to 5-celled; style short or elongated, terminal; stigma sub-capitate; ovules solitary in each cell, pendulous. Fruit drupaceous, with a crustaceous or bony endocarp, 1- to 5-celled, cells 1-seeded. Seeds small.—Distrib. About 130 species, all but about 20 Australian, the rest in New Zealand, the Pacific Islands, and the Malay Archipelago.

LEUCOPOGON MALAYANUS, Jack in Mal. Misc. I. v. 20, and Hook. Bot. Misc. II. 71. A small branching shrub, reaching 3 to 6 feet in height; branches grey, marked by the scars of fallen leaves, branchlets very leafy; branch-buds elongate, supported by imbricate parallel-veined ciliate deciduous scales. Leaves alternate, sessile, stiff, entire, narrowly lanceolate, acute and mucronate at apex, 1.5 to 2.5 in. long, 3 to 5 in. broad, shining and convex above, dull or glaucous beneath, ciliate when young; midrib none, nerves very close, slender, longitudinally parallel, in old leaves scarcely visible. Flowers in short axillary 3- to 7-flowered spikes, 5 in. long, the last flower imperfect; rachis villous, sometimes flexuose; bracts ovate, recurved, bracteoles 2, ovate, acute, ciliate, closely embracing the calvx. Calyx-lobes 5, crustaceous, ellipticoblong, 125 in. long, ciliate. Corolla campanulate, 1 to 2 in. long; lobes 5, 1 to 15 in. long, spreading, villous within. Hypogynous scales 5, minute, free, obtuse. Stamens 5, short, alternate with the corollalobes; filaments inserted near the top of the anthers; anthers curved, pendent, opening longitudinally; pollen globose. Ovary 5-celled; ovule 1 in each cell, oblong; style erect, 05 in. long, villous; stigma sub-globose. Fruit a 5-celled baccate drupe, 1 to 2 in. in diam., each cell 1-seeded. Seeds not seen. Wall. Cat. 3720; Wall. in Roxb. Fl. Ind., ed. Carey and Wall. II. 301; G. Don Gen. Syst. III. 777; DC. Prod. VII. 744; Mig. Fl. Ind. Bat. II. 1052; Kurz in Journ. As. Soc. Beng. XLVI. ii. 217, and For. Fl. II. 95; Clarke in Hook. f. Fl. Br. Ind. III. 477. Styphelia malayica, Spreng. Syst. IV. Cur. post, 67.

Perak: Scortechini 760; Cantley 46; King's Collector 7428, 8056.

MALACCA: Jack; Griffith (K.D.) 3453/1; Maingay (K.D.) 704; Lobb; on Mount Ophir, Moxon; Ridley. SINGAPORE: Jack; Sir R. Schomburgk 50; Wallich 3720; Ridley 1832.—DISTRIB. Bangka, Teysmann; Borneo, Ridley.

VAR. moluccana, Kurz in Journ. As. Soc. Beng. XLVI. ii. 217, and For. Fl. II. 96. Leaves 5 to 1 in. long, subulate-pointed, venation more prominent, branchlets more slender. L. moluccanum, Scheff. Obs. Phyt. III. 97.

KEDAH peak: Low.—DISTRIB. Tenasserim, Helfer (K.D.) 3453.

Order LXIX. PLUMBAGINEÆ.

Herbs or undershrubs. Leaves various, alternate or fascicled. Flowers in terminal scapes or branches, capitate, spicate, racemed or panicled; bracts scarious or leafy, often sheathing the flower, bracteoles 2. Calyx inferior, gamosepalous, tubular or funnel-shaped, 5- to 10ribbed, often hyaline between the ribs; lobes 5, usually scarious. Corolla hypogynous; petals 5, free or connate at the base or united in a linear tube; lobes spreading. Stamens 5, opposite the petals; filaments free or adnate in a tube with the corolla; anthers ovate or oblong, dorsifixed, cells parallel, dehiscing longitudinally. Ovary superior, sessile or very shortly stalked, 1-celled, 5-angular above; styles 5, distinct from the base or connate below; stigmas sub-capitate; ovule 1, pendulous from a basal ascending funicle, anatropous. Fruit included in the calvx or elongate or exsert, dry or indehiscent, membranous or hardened at the apex, circumsciss or breaking near the thin base, the apex often 5-valved. Seeds evlindric or elongate, pendulous. albumen copious or little or 0, radicle superior; embryo straight, cotyledons linear or oblong.—DISTRIB. Species about 200, mostly of seacoasts or desert places throughout the world.

Large shrubs with broad-petioled leaves; styles 5, distinct; stamens united in a tube with the corolla 1. EGIALITIS. Perennial herbs with auriculate leaves; style 1, filiform, with 5 stigmatic branches; stamens free 2. PLUMBAGO.

1. ÆGIALITIS, R. Br.

Simple-stemmed, soft-wooded shrubs. Leaves orbicular, alternate, coriaceous, glabrous, entire, smooth, gland-dotted, reticulately-veined, with long, thick, winged, amplexical petioles. Flowers in axillary or terminal panicles of racemes; bract 1, sheathing, coriaceous, obtuse; enclosing the 2 bracteoles. Calyx tubular, folded; lobes 5, short, induplicate-valvate. Corolla usually shorter than calyx, lobes 5,

slightly cohering at base. Stamens adhering to the base of the petals. Ovary 1-celled; styles free, stigmas capitate. Fruit a capsule, linear, long-exserted from the calyx, pentagonal, 1-seeded.—Distrib. Species 2, one Indian the other Australian.

ÆGIALITIS ROTUNDIFOLIA, Roxb. Fl. Ind. II. 111. A simplestemmed, soft-wooded shrub, 3 to 8 feet high; stem about 3 in. in diam., conical in shape. Leaves alternate, orbicular, very slightly acute at apex, rounded or slightly cordate at base, diam, 2 to 3 in., entire, glabrous, coriaceous, minutely glandular-dotted, shining above, dull beneath; midrib thick and prominent, veins at an angle of 60 degrees with the midrib, closely reticulate; petiole very stout, 2 to 3 in, long, prominently winged, the wings sheathing, amplexicaul, leaving annular scars when they fall. Inflorescence of axillary or terminal panicled racemes; flowers pale yellow, nearly sessile, enclosed in sheathing bracts; bract 1, ·3 to ·4 in. long, concave, obtuse, enclosing the two similar but smaller bracteoles. Calyx cylindric, furrowed, 2 to 3 in. long; teeth 5, short. Corolla slightly longer than calyx; lobes 5, narrow. Stamens inserted on the base of the corolla; filaments shorter than corolla-tube; anthers linear-oblong. Ovary 1-celled, styles free, stigma capitate, ovule 1 pendulous. Wall. Cat. 7240; Griff. Notul. IV. 207; Clarke in Hook. f. Fl. Br. Ind. III. 479; Prain Beng. Plants I. 638. Æ. annulata var. rotundifolia, DC. Prod. XII. 621. Æ. annulata, Kurz in Journ. As. Soc. Beng. XLVI. ii. 217; For. Fl. II. 96 (not of R. Br.). Ægianilites rotundifolia, Presl. Bot. Bemerk. 103.

MALACCA: Griffith (K.D.) 4156.—DISTRIB. Coasts of Bengal and Burma and the Andaman Islands, in mangrove swamps.

2. Plumbago, Linn.

Perennial herbs or undershrubs, rarely annual, branches usually straggling or sub-scandent. Leaves, if present, alternate, entire, the petioles usually amplexicaul, auriculate at base. Flowers in terminal spikes or spicate racemes, forming sometimes a leafy terminal panicle; bract 1, bracteoles 2, usually small. Calyx tubular, glandular, 5-fid, the teeth erect. Corolla funnel-shaped; tube slender, lobes spreading. Stamens free; filaments filiform, inserted on hypogynous glands; anthers oblong, dorsifixed, usually exsert. Ovary attenuate at apex; style slender, divided into stigmatose branches; ovule 1, pendulous from a basal ascending funicle. Fruit a capsule, included in the persistent calyx and corolla, circumsciss near the base, hardened above; seed solitary, albumen very small, embryo slender, radicle superior, cotyledons oblong.—Distrib. About 10 species, found in the warm regions of both hemispheres.

PLUMBAGO ZEYLANICA, Linn. Sp. Pl. (1753) 151. A straggling perennial herb; branches rounded, striate, glabrous. Leaves alternate, ovate, shortly acute at apex, rounded at base and suddenly narrowed and decurrent, 2 to 5 in. long, 1 to 2.5 in. broad, entire, thin, glabrous above, somewhat scurfy beneath and often glaucous; midrib slender, prominent beneath, main-nerves 6 to 7 pairs, also prominent, curving upwards, secondary nerves and reticulations obscure; petiole 5 to 1 in. long, winged by the gradually narrowing decurrent base of the blade, auricled and amplexicaul at base. Inflorescence a terminal leafy panicle of spicate racemes, the rachis densely glandular; bract ovate, acuminate, bracteoles 2, linear-subulate; pedicels very short or none, bracts and pedicels glandular. Calux narrowly tubular, about 5 in. long, more or less deeply 5-fid; lobes slender, hyaline on the margins, covered thickly on the back with prominent stalked red glands. Corolla-tube white, slender, funnel-shaped, membranous, about 1 in. long; lobes 5, nearly 5 in. long, ovate, acute, patent. Stamens 5, free; filaments very slender; anthers oblong, dorsifixed, exsert. Ovary ovoid; style filiform, dividing into 5 stigmatose branches. Capsule membranous below, thick above, 5-furrowed, sharply pointed; seed pendulous, oblong; cotyledons obtuse. DC. Prod. XII. 692; Roxb. Hort. Beng. 13, Fl. Ind. I. 462; Wall, Cat. 7241g; Wight Ill. t. 179; Mig. Fl. Ind. Bat. II. 994; Dalz. and Gibs. Bomb. Fl. 220; Kurz in Journ. As. Soc. Beng. XLVI. ii. 217; Clarke in Hook. f. Fl. Br. Ind. III. 480; Trimen Fl. Ceyl. III. 65; Prain Beng. Plants I. 639. P. auriculata, Bl. Bijdr. 736. P. viscosa, Blanco Fl. Filip. ed. I. 78. codivéli,' Rheede Hort. Mal. X. t. 8.

Penang: Curtis 93; Deschamps. Negri Sembilan: Ridley 10095. Singapore: Deschamps; King's Collector 284.—Distrib. Tropical regions of the Old World, doubtfully indigenous in the Malay Peninsula or elsewhere.

Order LXXVIII. GENTIANACEÆ.

[By C. B. CLARKE.]

Herbs, erect, twining, or floating; glabrous except Microrphium. Leaves entire; those of the lower main stem opposite except in the floating plants. Inflorescence in 2- to 3-divided cymes, or peduncles 1-flowered. Flowers symmetric in calyx, corolla, stamens (except in Canscora). Calyx tubular or campanulate; lobes 4 to 5 (or by accident (?) 6), oblong or linear. Corolla gamopetalous, tube long or short; lobes as many as calyx-segments, usually dextrorsely contorted in the bud. Stamens as many as the corolla-segments, all perfect (except in

Canscora); filaments on the corolla-tube; anthers of 2 parallel cells. Ovary 1- (or imperfectly 2-) celled; of 2 carpels, superior or stalked or slightly inferior; style linear or oblong; stigma capitate or shortly 2-lobed; placentas parietal, sometimes much intruded, partly coalescing in the axis; ovules very many. Capsule dehiscent or indehiscent, not rarely becoming more or less succulent; seeds many, albuminous.—Distrib. Species 700; found in all countries.

1. Exacum, Linn.

Glabrous erect herbs. Leaves opposite, usually 3- to 5-nerved. Flowers panicled, 4- to 5-merous. Calyx deeply lobed. Corolla rotate; tube globose; lobes ovate or oblong, blue or white. Stamens attached in the corolla throat; anthers large, of two oblong cells, which open first by terminal pores or short slits. Ovary more or less completely 2-celled; style linear; stigma sub-capitate. Capsule globose, septicidally 2-valved; seeds numerous, minute, cuboid.—DISTRIB. Species 30, whereof 20 Indian, the others in China, Malaya, Africa.

Stem 1 to 4 feet; corolla-lobes \(\frac{1}{2}\) in. long, azure blue \qquad \tau 1. \(E.\) tetragonum.

Stem 4 to 12 in.; corolla-lobes \(\frac{1}{2}\) to \(\frac{1}{3}\) in. long, pale blue \qquad \tau 2. \(E.\) pedunculatum.

1. EXACUM TETRAGONUM, var. β stylosa, C. B. Clarke in Hook. fil. Fl. Br. Ind. IV. 95. Stem 1 to 4 feet, quadrangular. Leaves 5 by 1 in., sessile, lanceolate, 3- to 5-nerved. Panicle many-flowered; bracts at its divisions 25 to 5 in. long, linear; flowers 4-merous, or rarely 5-merous. Calyx-lobes 25 in. long, ovate acuminate. Corolla-lobes 5 in. long, broadly elliptic acute, full azure-blue. Anthers 2 in. long, straight. Style 5 in. long. Capsule globose, 25 in. in diam. E. stylosum (sp.), Griseb. in DC. Prod. IX. 46. E. chironioides, Griseb. Gent. 109, in DC. Prod. IX. 45. E. Horsfieldianum, Miq. Fl. Ind. Bat. II. 556. E. sulcatum, C. B. Clarke in Journ. Linn. Soc. XIV. 425 (not of Roxb.). E. tetragonum, Vidal Fl. Filip. 191.

SINGAPORE: Lobb 473.—DISTRIB. From Burma to Borneo and the Philippines.

2. Exacum pedunculatum, Linn. Sp. Pl. ed. I. 112; ed. II. 163.

Stem 4 to 12 in., quadrangular, often much-branched. Leaves 1.5 by 5 in., sub-sessile, elliptic or lanceolate, 3-nerved. Panicle usually compound, many-flowered; lower bracts similar to the leaves, by degrees smaller, to the upper less than .25 in. long; flowers 4-merous. Calyx-lobes .17 to .2 in. long, ovate, acute, winged. Corolla-lobes .25 to .35 in. long, pale blue. Anthers .12 in. long, dehiscing finally half-way down. Capsule globose, .17 in. in diam. DC. Prod. IX. 46; Hook. fil. Fl. Br. Ind. IV. 97; Trimen, Fl. Ceyl. III. 182. E. pedunculare, Arn. in Ann. Sc. Nat. ser. 2, XI. 176; Wight Ic. t. 336. E. sulcatum, Roxb. Fl. Ind. ed. Carey & Wall. I. 415; DC. Prod. IX. 46 (syn. excl.).

SINGAPORE: Lobb 358.—DISTRIB. From Oudh and Bengal to Ceylon and Pegu.

2. MICRORPHIUM, C. B. Clarke, gen. nov.

A pubescent erect herb, repeatedly branched. Leaves alternate except a few distant opposite pairs on the main stem. Flowers numerous, solitary, pedicelled, in unilateral repeatedly branched cymes. Calyx short-cylindric, terete, sub-2-lipped, almost leathery; lobes 5, short. Corolla small; tube campanulate, lobes 5, equal, dextrorsely contorted in the bud. Stamens 5, equal, perfect; anthers exsert, cells oblong, parallel, dehiscing by a slit their whole length. Ovary 1-celled; placentas intruded; style linear, stigma sub-capitate. Seeds very small, ovoid, not angular.—Distrib. Species 1, Malayan.

1. Microrphium pubescens, C. B. Clarke, sp. nov. Stem, leaves, inflorescence, calyx covered with a short thick grey pubescence. Stem (upper part seen) 14 in. long; the lower part with opposite pairs of leaves (and branches) 2·5 in. apart; all the other numerous stem-divisions and leaves alternate. Leaves of the main stem ·75 by ·35 in., elliptic, entire, obtuse, narrowed at base; petiole 0 to ·1 in. long; the other leaves similar but smaller. Pedicels ·25 in. long. Calyx ·2 in. long; opening at first in two lips, one emarginate 2-nerved, the other ovate 3-nerved. Corolla-tube broad, lobes short, round, soon reflexed over the calyx-margin. Capsule ovoid, ·2 in. long, dry; seeds 200 μ in diam. Pollen globose; 25 μ in diam.

KEDAH: Curtis 2528. "Height 1 to 2 feet; petals white; anthers yellow" (Curtis).

3. Canscora, Lam.

Herbs, dichotomously branched, glabrous or very nearly so. Leaves opposite. Flowers mostly cymose. Calyx large, membranous, tubular, often winged; teeth much shorter than the tube. Corolla-tube cylindric; lobes 4, unequal (except in C. pentanthera). Ovary 1-celled;

placentas intruded; style linear, lobes 2, hemispheric. Capsule 2-valved or breaking up irregularly. Seeds very small, polyhedral.—DISTRIB. Species about 25, extending from Africa through South-east Asia to Australia.

One stamen only perfect; corolla irregular 1. C. diffusa.

All stamens perfect; corolla regular 2. C. pentanthera.

Sub-genus 1. Eu-Canscora. Calyx 4-toothed. Corolla sub-bilabiate. Stamens 4; 1 larger perfect, 3 shorter smaller or obsolete.

1. Canscora diffusa, R. Brown, Prodr. (1810) 451 in Obs. Erect annual, 4 to 20 in., much branched upwards. Leaves 1.5 by .5 in., lanceolate or elliptic, 3-nerved, often petioled, upper smaller. Cyme diffuse; lower bracts at its divisions .5 in. long, ovate, upper much smaller. Calyx \frac{1}{5} in. long; teeth lanceolate-linear. Corolla rose-coloured; tube \frac{1}{5} in., lobes \frac{1}{6} in. Capsule oblong, as long as the calyx. DC. Prod. IX. 64; Benth. Fl. Austral. IV. 372; Hook. fil. Fl. Br. Ind. IV. 103; Trimen Fl. Ceyl., III. 184. Exacum diffusum, Willd. Sp. Pl. I. 637. Orthostemon erectum, R. Br. Prod. 451; DC. l.c. 63. O. Hugelii, DC. l.c. 63. Pladera virgata, Roxb. Fl. Ind. ed. Carey & Wall. I. 417; Hook. Bot. Misc. III. 88 t. 25.

SINGAPORE: Lobb 345. A common species, extending from East Tropical Africa throughout India to Australia and the Philippines.

Sub-genus 2. Pentanthera. Stamens 5 (or 6), equal, anthers all similar, perfect. Corolla-lobes 5 (or sometimes 6), equal, dextrorsely contorted in the bud.

2. Canscora pentanthera, C. B. Clarke, sp. nov. A slender undershrub, 18 in. high, glabrous except the minutely gland-puberulous (young) petioles; stem terete with many opposite branches. Leaves opposite, 3 by 1 in., ovate-lanceolate, acuminate, attenuate at the base; petiole 0 to 2 in. Cymes loosely, repeatedly dichotomous, often carrying 10 flowers; bracts at the divisions similar to the leaves, but gradually smaller, becoming sessile, a few pairs connate into perfoliate bracts. Flowers solitary, 5 in. long, on pedicels 12 to 5 in. long. Calyx 35 in. long, membranous; tube triquetrous, narrowly 3-winged, ovoid-cylindric; lobes less than one-third the length of the tube, ovate, imbricate, apiculate. Corolla white (Ridley); tube as long as the calvx, lobes 5 (or not rarely 6), oblong-elliptic, equal, sub-erect, contorted dextrorsely (sensu Linneano) in the bud. Stamens 5 (or 6 in the 6-lobed corolla), equal, perfect; filaments inserted in the upper part of the corolla-tube from which the erect anthers are half-exsert; anther-cells 2, oblong or linearoblong, opening by longitudinal slits; pollen 25 by 20 μ , ellipsoid, irregularly longitudinally striate. Ovary oblong, when young thin,

almost succulent; placentas much intruded; style linear, with 2 round stigmatic lobes. Capsule broad-ellipsoid, crustaceous, almost succulent (dehiscence not clear); style persistent; seeds 300 μ in diam., ovoid, somewhat angular, brown.

Perak, Waterloo: Robertson 9088. Selangon: Sua Batu, Ridley; Gua Batu, Ridley 8218. Kedah: Langkaui, Curtis 2516.

This species, the only one in the sub-genus, differs in the estivation of the corolla, the number of the stamens, the anthers all equal, the persistent style, from the characters assigned to Canscora.

4. Crawfurdia, Wall.

Glabrous twiners. Leaves opposite, petioled, 3-nerved. Flowers showy, axillary. Calyx tubular; teeth 5 (or 4), long, often very long. Corolla long, tubular-funnel-shaped; lobes 5, short. Stamens 5 on the corolla-tube; anthers oblong. Ovary stalked, 1-celled, placentas parietal; style linear, stigmas 2, short-oblong. Fruit globose or ellipsoid, berried or capsular; seeds many, 2- (or imperfectly 3-) angled.—Distrib. Species 10-12, extending from India to Manchuria.

1. Crawfurdia Blumii, G. Don Syst. IV. 200. Stem often 3 to 4 feet long. Leaves (blade) 1.5 by .75 in., ovate-lanceolate, acute, entire; base rounded or narrowed; petiole .35 in. Flowers axillary, solitary, sub-sessile, or the pedicel .25 to 1.5 in. long. Calyx narrow, angular; tube .2 in. long, teeth .25 in. long, linear. Corolla 1.25 to 1.5 in. long, light purple. Fruit .6 in. long, ellipsoid, purple, succulent. Seeds imperfectly 3-angular, angles (or 2 of them) often narrowly winged. Miq. Fl. Ind. Bat. v. II. 561 (Blumei). C. trinervis, Hassk. Cat. Hort. Bogor. 128, in Tidjsch. Nat. Gesch. X. 126. Tripterospermum trinerve, Blume Bijd. 849; Griseb. in DC. Prod. IX. p. 121. [Cf. C. B. Clarke in Fl. Br. Ind. IX. p. 107, sub Crawfurdia affini, Wallich.]

Pahang, 7,000 feet alt.: Wray 1570.—DISTRIB. Sumatra, Java.

5. VILLARSIA, Vent.

Floating, glabrous herbs. Leaves long-petioled, ovate, entire or sinuate. Peduncles solitary, 1- (or many-) flowered. Calyx deeply 5-lobed. Corolla broadly campanulate; tube short, lobes sub-rotate. Stamens 5; filaments filiform, on the corolla-tube; anthers sagittate. Ovary 1-celled; style short; stigma of 2 small lobes; placentas parietal. Capsule globose, 1-celled, 4-valved at the apex; seeds several (or numerous).—Distrib. Species 12, in Africa or in Australia, except the following Malay species.

1. VILLARSIA AURANTIACA, Ridley MS. A small herb; stems 2 in.

long, with leaves and peduncles at the nodes. Leaves all long-petioled, ·35 in. in diam., widely excavated at the base, ovate, margin sinuate; petiole ·5 to 2 in. long. Peduncles solitary, 1 to 2 in. long, ebracteate, 1-flowered. Calyx ·17 in. long, lobes oblong. Corolla ·35 in. in diam.

Pahang: Kwala Pahar, Ridley.

This example shows no fruit, and the flowers are not in a state for dissection. This collection has been supposed to be near *Limnanthemum parvifolium*, Griseb., which has smaller flowers, with the peduncles (several) clustered in the axil of a sessile leaf. This plant of Ridley appears to come near the Swan River *Villarsia violifolia*, F. Muell.

6. LIMNANTHEMUM, S. P. Gmel.

Peduncles several in the axil of a nearly sessile leaf. Capsule thin, breaking up irregularly, otherwise as Villarsia.—DISTRIB. Species 20, dispersed throughout the Tropical and Temperate Zones.

1. LIMNANTHEMUM PARVIFOLIUM, Griseb. in DC. Prod. IX. 141. Stem 3 to 8 in. long, slender, with distant nodes. Leaf ·75 in., round, ovate, excavated at base, gland-dotted on the under surface; petiole scarcely ·08 in. Pedicels clustered, 0 to ·25 in. long. Calyx-lobes ·08 in. long, lanceolate, acute. Corolla-lobes ·17 in. long, white, fimbriate. Capsule ·17 in. long, ellipsoid, sessile, about 10-seeded; seeds smooth but with capitate papillæ sparsely irregularly scattered. Hook. fil. Fl. Brit. Ind. IV. 132; Trimen, Fl. Ceyl. III. 189.

SINGAPORE: Cuming 2280 (in Mus. Brit.).—DISTRIB. Malabar, Ceylon; Chittagong to Tavoy.

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Materials for a Flora of the Malayan Peninsula.—By SIR GEORGE KING, K.C.I.E., LL.D., F.R.S., F.L.S., late Superintendent of the Royal Botanic Garden, Calcutta, and J. Sykes Gamble, Esq., C.I.E., M.A., F.R.S., F.L.S., late of the Indian Forest Department.

No. 17.

This contribution embraces the Natural Orders Myrsinaceæ, Sapotaceæ, Ebenaceæ, Styraceæ, Oleaceæ, which are given under the joint names of the authors, the actual descriptions having been prepared by Sir George King for the Ebenaceæ and by Mr. J. S. Gamble for the rest.

The 5 Natural Orders comprise 24 genera and 221 species. There are no new genera, but the number of new species reaches 103.

Order LXX. MYRSINACEÆ.

Trees, shrubs (erect or climbing), or undershrubs, generally evergreen. Leaves usually alternate, sometimes opposite, entire dentate or crenate, often dotted with pellucid round or linear resinous glands. Stipules none. Flowers regular, usually small, white or reddish; hermaphrodite or occasionally polygamo-diœcious; generally in panicles, racemes or umbels. Calyx inferior (in Mæsa adnate to the ovary), 4-6-lobed, the lobes valvate or imbricate, sometimes enlarged in fruit, persistent, often marked with glandular dots or lines. Corolla 4-5-lobed; the tube usually very short, sometimes wanting; lobes twisted to the left in the bud, usually overlapping to the right, rarely

valvate, often gland-dotted or -striate. Stamens opposite to the corollalobes and equal to them in number, free or adnate to the lobes or in an inner ring, generally erect; filaments long or short; anthers opening by slits, usually introrsely, sometimes septate as in Ægiceras and Ardisia littoralis, sometimes with terminal openings as well, free or adherent by their edges; the connective often thickened and produced. sometimes glandular; staminodes sometimes present, though not in Malay species. Ovary globose, ovoid or oblong, free (in Masa adherent to the calvx-tube), 1-celled, narrowed into or surmounted by the style: style filiform or columnar, stigma usually simple; ovules few or many, inserted on or immersed in a free usually globose central placenta. Fruit usually small, globose (in Ægiceras linear, curved, acuminate); epicarp fleshy, mesocarp crustaceous, endocarp membranous, separable; usually one-rarely several-seeded (as in Mæsa), indehiscent. Seeds usually globose, hollowed at the base: in Mæsa many and angled: albumen pitted or ruminate; embryo transverse, cylindric; radicle usually elongate.—DISTRIB. Tropical or sub-tropical regions of both hemispheres, chiefly in Asia and South America; genera 32, species upwards of 900 (according to Mez Monog. Myrsinea).

Calyx-tube adnate to the ovary; fruit many-seeded (Tribe I. Mæseæ) :-Trees or shrubs; calyx 2-bracteolate; flowers in simple or compound racemes 1. Mæsa. Calyx-tube free from the ovary; fruit one-seeded (Tribe II. EUMYRSINEÆ):-Fruit round; anther-cells usually opening by slits, rarely septate:-Corolla-lobes imbricate in bud :-Flowers in axillary or lateral fascicles; trees or shrubs 2. Myrsine. Flowers in racemes or panicles; climbing plants, rarely 3. EMBELIA. Corolla-lobes valvate in bud; flowers in paniculate spike-like racemes; small shrubs with parallel-veined leaves .. 4. Labisia. Corolla-lobes contorted in bud :-Anthers sagittate, rarely septate; corolla-lobes overlapping to the right ... 5. Ardisia. Anthers sagittate-lanceolate, the connective produced in a membranous wing; corolla-lobes overlapping to the left .. 6. Antistrophe. Fruit elongate, cylindric, long-pointed; anthers markedly septate 7. ÆGICERAS.

1. Mæsa, Forsk.

Trees or shrubs, erect or straggling. Leaves entire, dentate or serrate, usually pellucid-punctate, sometimes with resinous lines. Flowers hermaphrodite or unisexual, in terminal or axillary racemes, the pedicels bracteate. Calyx bibracteolate, 4-5-lobed; lobes persistent,

imbricate; the tube adnate to the ovary, sometimes with resinous lines. Corolla shortly campanulate, 4–5-lobed; the lobes usually as long as the tube or rather shorter, rounded with inflexed tips, sometimes resinous-lineate. Stamens 4 or 5, inserted on the corolla-tube; filaments short; anthers introrse, oblong-cordate. Ovary adnate to the calyx-tube; style short; stigma small, entire or shortly 3–5-lobed; ovules numerous, placenta globose. Fruit small, dry or fleshy, ovoid or subturbinate, crowned with the persistent style, many-seeded. Seeds numerous, angular, immersed in hollows of the placenta, and arranged around it with hexagonal surfaces, embryo small, oblique or transverse, cotyledons narrowly ovate.—Distrib. Species, over 100 (according to Mez), chiefly in the tropical regions of the Old World, a few in Australia and the Pacific Islands; all the Malayan species belonging to sub-genus Eumæsa, Mez.

Leaves entire:— Flowers in larg

Flowers in large axillary or pseudo-terminal panicles of racemes; branches of inflorescence glabrous

Leaves faintly lobed :-

Leaves very slightly dentate, almost coriaceous, under 3.5 in. long, midrib and main-nerves very prominent; inflorescence as long as or only a little shorter than leaves ...

Leaves membranous, over 4 in. long:—

Leaves pale when dry, under 3 in. broad, distantly dentate, inflorescence longer than the petiole ...

Leaves dull green when dry, over 4 in. broad, inflorescence scarcely longer than the petiole

Leaves prominently dentate ...

1. M. macrothyrsa.

2. M. ramentacea.

3. M. impressinervis.

.. 4. M. striata.

.. 5. M. pahangiana.

6. M. indica.

1. Mæsa macrothyrsa, Miq. Fl. Ind. Bat. Suppl. 573 (1862). A slender climbing shrub reaching 30 to 50 feet in length; branches brown, somewhat angled and flexuose, striate. Leaves entire, chartaceous; elliptic, shortly bluntly acuminate at apex, rounded at base; smooth and dull on both surfaces; 3 to 4 in. long, 1.5 to 2 in. broad; midrib prominent, impressed above; main-nerves 5 to 7 pairs, distant, starting from the midrib at about 60° and curving upwards; secondary nerves and reticulations indistinct; petiole .5 to .7 in. long, channelled above by the decurrent margins of the blade. Inflorescence a large leafy terminal many-flowered tripinnate panicle, the branches rusty pubescent; pedicels about .025 in. long, supported by a slightly shorter ovate-acute bract, and bearing 2 similar bracteoles below the flowers. Calyx superior, cupular; lobes 4, occasionally 5, rounded, denticulate, .04 in. long, gland-dotted; tube very short. Corolla dull white or pink, longer than calyx; tube as long as lobes; lobes 4 or 5, rounded, often with

small lobules between, denticulate, with about 3 to 4 glandular lineoles. Stamens inserted near the base of the corolla-tube; anthers globose; filaments about twice as long as anthers. Ovary rounded, depressed, crowned with a short cylindric style and obtusely 3-4-lobed stigma. Fruit very small, 05 in. in diam., globose, glabrous, faintly striate, crowned about one-third of the way down with the persistent calyxteeth. Seeds very minute, angled. Scheff. Myrs. 29; Mez Monog. Myrs. 49. M. floribunda, Scheff. Myrs. 18. M. Korthalsiana, Scheff. Myrs. 18 (?)

Perak: Wray 2684; Scortechini 122, 1655; King's Collector 725, 2722, 3777, 4968, 5326.—Distrib. Sumatra, Korthals, Beccari 887;

Borneo, de Vriese, Teysmann.

We have always found the flowers tetramerous, as described by Miquel and Scheffer. Mez describes them as either 4- or 5-merous. This is a well-marked species on account of its large terminal inflorescence, whose pubescent branches easily distinguish it from those occasional forms of *M. ramentacea* which have part of the inflorescence pseudo-terminal.

2. Mæsa ramentacea, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 231 (1824). A large shrub or small tree, usually branched from the base and sending out many straggling or climbing branches often 30 to 40 feet long or more; branchlets smooth, somewhat striate when dry. Leaves entire, chartaceous; ovate-lanceolate or elliptic, acuminate at apex, rounded or cordate at base; 3 to 8 in. long, 1.5 to 4 in. broad; smooth on both surfaces and generally shining above; midrib prominent, often impressed above; main-nerves slender, distant, 5 to 10 pairs. starting at 45° with the midrib and curved upwards; secondary nerves and reticulations not apparent: petiole 3 to 5 in. long, slightly winged by the decurrent margins of the blade, which are often connivent above. Inflorescence axillary or sometimes pseudo-terminal, glabrous, many-flowered, consisting of more or less closely packed racemes arranged in bipinnate panicles, shorter or longer than the leaves; pedicels 1 to 15 in. long, slender, supported by a minute lanceolate bract and with 2 very minute ovate-lanceolate bracteoles below the flower; buds minute, globose, depressed at top. Calyx superior, cupular; tube very short, about 025 in. long; lobes 5, ovate, faintly ciliate, as long as the tube. Corolla '075 in. long; lobes half the length, ovate or ovatereniform, edges undulate, with a few brown glandular lineoles. Stamens short, longer in ? flowers, inserted a little below the top of the tube; anthers rounded, filaments as long as the anthers, dorsifixed. Ovary in ? flowers adnate to the base of the calyx-tube, style short, stigma minutely 4-lobed, ovules many. Fruit globose, 1 to 15 in. long, crowned with the persistent teeth of the calyx; seeds minute, angled, albuminous, embryo small, transverse. A. DC. in Trans. Linn. Soc. XVII. 133, Prod. VIII. 77; Scheff. Myrs. 15; Miq. Fl. Ind. Bat. II. 1006; Kurz in Journ. As. Soc. Beng. XLVI. ii. 220; For. Fl. II. 99; Clarke in Hook. f. Fl. Br. Ind. III. 508; Koord. & Val. Bijdr. V. 218; Mez Monog. Myrs. 27; Prain Beng. Pl. 642. M. ovata, A. DC. l.c. 133, t. 4, Prod. l.c. 77; Scheff. Myrs. 14. M. lanceolata, Don Prod. 148. M. acuminata, missionis, and glabra, DC. Prod. l.c. 77, 78, 82. M. sumatrana, Scheff. Myrs. 15. Bæobotrys ramentacea, Roxb. Hort. Beng. 16, Fl. Ind. I. 558; Wall. Cat. 2322. B. ovata, Wall. Cat. 2324. B. glabra, Roxb. Fl. Ind. I. 560. B. fragrans, Wall. Cat. 2323. B. (?) missionis, Wall. Cat. 6523.

Kedah: Langkawi, Curtis 2554, 3409. Penang: Wallich 2324; Maingay (K.D.) 1001; J. Scott; G. King; Phillips; Deschamps. Perak: Scortechini 382a, 606b, 628; Wray 1286, 1291, 1912, 2363, 2787; King's Collector 171, 1222, 1909, 2788, 3883, 4144, 4281, 4497, 4915, 5088, 5113; Curtis. Pahang: Ridley 2175. Selangor: Ridley; Goodenough 10554. Negri Sembilan: Ridley 10067. Malacca: Griffith (K.D.) 3552; Cuming 2286; Miller 9; Hervey; Goodenough 1036, 1742; Derry 37, 1063; Ridley 10099. Johore: Lake & Kelsall 4035; G. King. Singapore: Schomburgk 91; Lobb 324; T. Anderson 126; Ridley 2064, 2805: Goodenough 1644; Hullett 38, 56, 885, 887.— Distrib. Eastern Bengal and Burma, Andaman and Nicobar Islands, Sumatra, Java, Borneo.

We follow Mez in not keeping up the var. ovata. The large mass of material available shows clearly that in shape of leaf and in inflorescence the variation is regular, and that the form with cordate long-acuminate leaves passes gradually into that with ovate broad short-acuminate leaves, and that similarly the inflorescence changes. A monstrous form with moss-like inflorescence similar to those often seen in India on M. Chisia and other species, is not uncommon.

3. Mæsa impressinervis, King & Gamble, n. sp. A bush or small tree; branches half as thick as a goosequill, glabrous, pale brown, and prominently longitudinally wrinkled when dry. Leaves thinly coriaceous; elliptic, shortly acuminate at apex, cuneate at base; entire or very faintly dentate only near the apex, margins recurved when dry, reticulate and shining above, dull and paler beneath; 3 to 3.5 in. long, 1.25 to 1.75 in. broad; midrib prominent, impressed above; main-nerves 7 or 8 pairs, also prominently impressed above and prominently raised on the lower surface, arching upwards to meet near the margin; secondary nerves few, inconspicuous as are the reticulations; petiole 2 to 25 in. long, bordered by the decurrent edges of the blade, which are almost connivent above. Inflorescence an axillary raceme, simple or with one short branch near the base, 1.5 to 2.5 in. long, and so shorter

than the leaves; pedicels slender, 1 in. long, with a '06 in. long subulate bract at the base and 2 similar bracteoles beneath the flower; buds nearly globose. Calyx superior, '05 in. in depth, cupular, with 5 imbricate broad incurved concave glabrous lobes. Corolla rotate with 5 imbricate rounded broad lobes, 1 in. deep; tube rather longer than lobes. Stamens 5, inserted on the base of the corolla; anthers globular; filaments flattened, longer than the anthers. Ovary inferior, depressed, surmounted by a flattened lobed stigma, 1-celled; ovules many, cuneate, on a central basal placenta. Fruit unknown.

PERAK: Gunong Bubu, at 5,000 feet elevation; Wray 3850, 3886.

4. Mæsa striata, Mez Monog. Myrs. 42 (1901). A shrub or small tree; branches smooth, reddish, with scattered lenticels. Leaves membranous; rather variable, elliptic or elliptic-oblong, rounded or acuminate at apex, bluntly acute and sometimes unequal at base; entire or undulate or broadly dentate, especially on the upper half, pale green when dry, glabrous except for a few occasional stiff hairs on the midrib beneath, striate with many faint very slender lineoles; 4 to 7 in. long, 2.5 to 3 in. broad; midrib angular, prominent beneath, main-nerves 7 to 8 pairs, slender; secondary nerves and reticulations faint and irregular; petiole slender, 4 to 1 in. long, channelled above. Inflorescence of axillary racemes, simple or joined in a sub-sessile panicle, rarely over 2 in. long; pedicels very slender, 05 to 1 in. long, with a subulate bract at base, half their length, and 2 acute bracteoles under the flower. Calux superior, about 1 in. deep; lobes 5, imbricate, oyate, rounded, about 4-striate, edges hyaline; tube as long as lobes. Corolla as long as calyx, rotate, '1 in. in depth; lobes 5, imbricate, rounded, crenate, glabrous. Stamens 5, inserted near the base of the corolla; anthers ovate, slightly divaricate; filaments 2 to 3 times as long as anthers. Ovary inferior, depressed, rounded; style short cylindrical, stigma 4-lobed; ovules many, cuneate, on a central basal placenta. Fruit round, ·1 to ·15 in. in diam., smooth, faintly ribbed, crowned by the persistent calyx-lobes and style.

Penang: at Paya Trobong, Curtis 2857. Perak: King's Collector 2287.—Distrib. Sumatra, Forbes 1260, 1287, 1315, 1376.

5. Mæsa pahangiana, King & Gamble, n. sp. Apparently a shrub; branches round, smooth, dark brown when dry. Leaves membranous; rhomboid-obovate, acuminate at the apex, rounded cuneate at base; faintly crenate especially in the upper half; glabrous on both dull surfaces; 7 to 8 in. long, 4 to 4.5 in. broad; midrib slender, prominent beneath; main-nerves distant, 8 to 9 pairs, at about half a right angle with the midrib, sometimes branched; secondary nerves few and like the reticulations indistinct; petiole slender, 8 to 1 in. long. Inflores-

cence a simple axillary raceme, as long as or slightly longer than the petiole; pedicels slender, about '1 in. long, supported by a minute subulate bract below and with two similar bracteoles below the flower. Calyx superior, cupular, with a very short tube and 5 triangular imbricate teeth '6 in. long, glabrous, hyaline at the edges and very faintly brown-glandular. Corolla as long as calyx; lobes 5 imbricate, glabrous, rounded, somewhat crenate, with 2 to 3 prominent brown glandular lineoles; tube half the length. Stamens nearly as long as corolla, inserted near its base; filaments about twice as long as the anthers; anthers emarginate, cells somewhat divaricate. Fruit globose with a conical tip surrounded by the remains of the corolla and the persistent calyx, and surmounted by the short persistent style, ribbed, '125 in. in diam., glabrous.

Pahang: at Tanjong Antan, Ridley 2175A.

Only one specimen is unfortunately available, and that in fruit, with only remains of flowers.

6. Mæsa indica, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 230 (1824). A shrub reaching 4 to 6 feet in height; branchlets brown, smooth, lenticellate. Leaves chartaceous; elliptic or elliptic-oblong, acuminate, rounded or acute at the base; repand-dentate, about 3 teeth to each main-nerve; 3 to 7 in. long, 2 to 3 in. broad; midrib very prominent, often broad; main-nerves 8 to 12 pairs, others closely reticulate; glandular striæ long, prominent; petiole 5 to 1 in. long, channelled above by the decurrent bases of the blade. Inflorescence of simple or compound axillary racemes, much shorter than the leaves, usually 1 to 3 in. long; pedicels slender, 05 to 1 in. long, longer in fruit; bracts subulate, in flower as long as pedicels; bracteoles 2, minute. Calyx superior, with 5 imbricate lobes, which are ovate, ciliate, striate, about .04 in. long, almost acute or rounded at apex. Corolla as long as calyx; lobes denticulate, glandular-striate; tube as long as lobes. Stamens inserted at base of corolla-tube; anthers ovate, cells divaricate; filaments dorsifixed, rather longer than anthers. Ovary rounded; style short cylindric, stigma obtuse; ovules many. Fruit round, smooth, striate, 15 in. long, crowned at the summit by the persistent calyx-lobes and the remains of the stigma. Seeds angular. A. DC. in Trans. Linn. Soc. XVII. 134, Prod. VIII. 80 (in part); Wall. Cat. 2318 E.; Clarke in Hook. f. Fl. Br. Ind. III. 509 (in part); Koord. & Val. Bijd. V. 222; Mez Monog. Myrs. 29. Baobotrys indica, Roxb. Hort. Beng. 16, Fl. Ind. I. 557.

PERAK: Wray 3314, 3349; Scortechini 16, 733; Ridley 3007, 9741; King's Collector 7712.—DISTRIB. Burma, Java.

2. Myrsine, Linn.

Trees or shrubs. Leaves entire or serrate, often thick, usually pellucid-punctate. Flowers polygamous or directous, fascicled, axillary or on very short branches, pedicels short with many imbricate bracts. Calyx small, lobes 4 to 5 persistent. Corolla 4-5-lobed, the lobes imbricate in bud, recurved in flower. Stamens 4 to 5; filaments short, inserted at the base of the corolla-lobes; anthers short, ovate; staminodes none. Ovary free, globose or ovoid; style usually short, cylindric or angular; stigma capitate or 2-5-lobed; ovules few or many, immersed in the placenta. Fruit a small, dry or somewhat fleshy, berry, 1-seeded. Seed solitary, globose, sessile, hollowed at the base; albumen pitted; embryo elongate, cylindric or curved, horizontal.—Distrib. Species about 80, chiefly tropical, a few in Japan, extra-tropical Africa, Australia and New Zealand. All our species belong to Mez' genus Rapanea.

Arrested branches bearing the umbels very short, $\cdot 1$ in, long or under:—

1. Myrsine avenis, A. DC. in Trans. Linn. Soc. XVII. 107 (1834). A small tree; branches pale, rounded; branchlets wrinkled when dry. faintly ferruginous-tomentose, leaf-buds long acuminate. entire, chartaceous; oblong-lanceolate, bluntly acute at apex, acutely narrowed at base, glabrous, marked with resinous often very conspicuous lineoles and dots along the margin especially near the apex, margins usually recurved; 1 to 2.5 in. long, 5 to 75 in. broad; midrib prominent, impressed above; main-nerves very obscure as are the reticulations; petiole ·2 in. long, slender, edged with the ciliate margins of the decurrent blade. Flowers in compact sessile 2-5-flowered umbels on very short thick arrested branches; bracts oblong acute; pedicels about 1 in. long, angular; flower-buds ovate, flowers 5-merous. Calyx-lobes triangular, acute, ciliate, with few round glandular dots; tube as long as lobes. Corolla-lobes imbricate, elliptic, pubescent on the margins, sparsely round-gland-dotted, connate for about one-third of their length. Stamens as long as corolla-lobes; anthers ovate, apiculate, pubescent at tip; filaments and lower part of anthers attached about half-way up the corolla-lobes. Ovary rounded, conical; style short in &, oblique and with long channelled stigma in 2. Berry globose, 1 in. in diam., glandular, smooth, tipped with the persistent style. DC. Prod. VIII. 96; Miq. Pl. Jungh. 189, and Fl. Ind. Bat. II. 1015; Scheff. Myrs. 47; Koord. & Val. Bijdr. V. 234. Myrsine capitellata, Wall. var. avenis Clarke in Hook. f. Fl. Br. Ind. III. 512 (in part); Stapf in Trans. Linn. Soc. Ser. 2, IV. 199. Ardisia avenis, Blume Bijdr. 691. Rapanea avenis, Mez Monog. Myrs. 357.

SINGAPORE: Ridley 253.—DISTRIB. Java, Celebes, Borneo.

2. Myrsine Porteriana, Wall. Cat. 6525 (1829). A shrub or small tree; branches grey, rough; branchlets slender, angled when dry, leafbuds lanceolate. Leaves chartaceous, entire; oblong-lanceolate, bluntly acute and slightly emarginate at apex, cuneately narrowed at base, glabrous, glandular dotted, especially along the margin, and often glandular-lineolate, black or grevish when dry; 1.5 to 3.5 in. long, ·75 to 1·25 in, broad; midrib prominent beneath, impressed above; mainnerves 8 to 12 pairs, the lowest pair running parallel to the midrib and there joined by the rest, not always easily seen; secondary nerves few, slender, reticulations minute; petiole slender, 2 to 4 in. long, channelled above by the decurrent and almost connivent, slightly fimbriate, edges of the blade. Flowers in compact sessile umbels on the summit of a short thick cone-like bracteate arrested branch about ·1 to ·3 in. long; bracts ovate, bracteoles oblong, blunt, ciliate; pedicels angled 1 in. long; flower-buds ovate, flowers greenish-white, usually diœcious, 5-merous. Calyx-lobes ovate acute, 05 in. long, ciliate, marked with prominent dark round or lineolate glands; tube as long as lobes. Corolla-lobes oblong obtuse, 1 to 15 in. long, minutely pubescent on the margins, marked by prominent dark rounded and lineolate glands, connate to one-fourth of their length, revolute in flower. Stamens inserted on the corolla, the filaments and lower half of the anthers adnate with it, those of 3 flowers ovate apiculate, those of 2 flowers sagittate; in open flowers exsert, longer than the revolute lobes. Ovary ovoid, glabrous, & flowers with a short straight style, & flowers with an oblique style and oblique folded stigma. Berry globose, glabrous, 1 in. in diam., dark blue when fresh, pale when dry, striate from the elongated vertical glands. A. DC. in Trans. Linn. Soc. XVII. 106, Prod. VIII. 95. M. capitellata var. avenis, Clarke in Hook. f. Fl. Br. Ind. III. 512 (in part). Rapanea Porteriana, Mez Monog. Myrs. 358.

Penang: Porter in Wallich 6525; Maingay (K.D.) 1005; Curtis 1013, 3728, on Government Hill, road to Crag. Perak: Ridley 2992; Wray 678, 1537; King's Collector 5001, usually at 5,000 feet eleva-

tion. Pahang: Ridley 1669a. Selangor: Ridley 8208. Malacca:

Griffith (K.D.) 3543; Ridley 10076, on Mount Ophir.

3. Myrsine Perakensis, King & Gamble, n. sp. A tree; branchlets thick, smooth, wrinkled when dry, terminal leaf-buds lanceolate. Leaves entire, coriaceous; oblong, bluntly acute at apex, narrowed at the base. glabrous, shining above, margins recurved, glandular dots many, inconspicuous; 4 to 5 in. long, 1.5 to 2 in. broad; midrib thick, very prominent; main-nerves 20 to 26 pairs, prominent above, at about twothirds of a right angle with the midrib, parallel at first, arching afterwards to meet near the margin; secondary nerves similar but more slender. reticulations prominent; petiole 3 in. long, very thick, winged by the decurrent margins of the blade. Flowers in compact sessile umbels on the summit of a thick, cone-like, bracteate, arrested branch about 1 in. long, in the axils of the leaves or below them on the current year's wood, so forming a thick cluster below the terminal leaves: umbels 5-8flowered, pedicels ·15 to ·2 in. long, thick and angular when dry; bracts ovate, scaly, sometimes ciliate. Calyx-lobes ovate acute, glandularciliate, about 05 in. long, ciliæ jointed. Corolla and Stamens unknown. Berry globose, sometimes conical at top, 1 to 15 in. in diam., pericarp pale brown when dry, striate with obscure oblong glands.

PERAK: Wray 3856; Scortechini, 766, at 5,000 feet elevation.

4. Myrsine Wrayi, King & Gamble, n. sp. A tree; branchlets stout, striate when dry. Leaves entire, coriaceous; elliptic-oblong, rounded at the apex, narrowly cuneate at base; 3 to 5 in. long, 1 to 1.75 in. broad, glabrous; midrib slender; main-nerves very obscure, about 12 pairs, meeting in an intramarginal nerve near the edge, reticulations many, somewhat raised beneath when dry; petiole '5 to '7 in. long, bordered above by the decurrent margins of the blade, wrinkled at the base. Flowers in peduncled axillary few-rayed umbels; bracteoles minute, triangular; peduncles '3 to '5 in. long; rays of umbel 3 to 4, pedicels about '35 in. long, clavately thickened above. Calyx-lobes triangular-ovate, glandular-ciliate, acute, '05 in. long. Corolla and Stamens unknown. Fruit round, '2 in. in diam., crowned by the persistent base of the style; pericarp rugosely striate.

PERAK: Wray 232, at 4,500 feet.

5. Myrsine umbellulata, A. DC. in Trans. Linn. Soc. XVII. 135 (1834). A small tree; branchlets thick, glabrous, reddish-brown Leaves entire, coriaceous; elliptic-obovate, obtuse and emarginate at apex, acute at the base; glabrous above, rusty beneath, black glandular dots frequent, margins often recurved; 2 to 3.5 in. long, .75 to 1.25 in. broad; midrib prominent, slender; main-nerves inconspicuous, slender, raised on upper surface, depressed on lower, reticulations obscure;

petiole ·3 to ·5 in. long, rugose, bordered above by the decurrent margins of the blade. Flowers in axillary scattered umbels on thick cone-like bracteate arrested branches, about ·15 in. long; pedicels very slender, ·3 to ·4 in. long, glabrous. Calyx-lobes ovate, acute, very shortly ciliolate, minute, recurved in fruit. Corolla and Stamens unknown. Berry globose, ·3 in. in diam., smooth, pale when dry, crowned with the persistent style. A. DC. Prod. VIII. 95; Miq. Fl. Ind. Bat. II. 1014. M. capitellata, var. avenis, Clarke in Hook. f. Fl. Br. Ind. III. 512 (in part). Embelia umbellulata, Wall. Cat. 2312. Rapanea umbellulata, Mez Monog. Myrs. 362.

SINGAPORE: Wallich 2312.—DISTRIB. Sumatra, Borneo.

3. EMBELIA, Burm.

Small trees or shrubs, usually climbing, often extensively. Leaves alternate, entire, dentate or serrulate, usually glandular, petiole often margined. Flowers in axillary or terminal racemes, simple or paniculate, white or pink, hermaphrodite or polygamo-diœcious. Calyx free, 4–5-lobed, persistent, the lobes rounded or ovate. Corolla 4–5-lobed, the lobes imbricate or contorted, tube none or short. Stamens 4 to 5; filaments short or elongate, inserted on the corolla; anthers ovate-oblong, obtuse or acute; staminodes none. Ovary ovoid, globose or conical; style short; stigma capitate; ovules few, inserted on a subglobose placenta. Fruit a small drupe, globose, 1-seeded, crowned by the persistent style. Seed ovoid, hollowed at the base, albumen pitted, embryo transverse, curved.—Distrib. About 60 species, in the tropical regions of the Old World.

Inflorescence terminal or terminal and axillary, paniculate:-Petals free (Sect. I. EUEMBELIA) :-Leaves membranous or chartaceous :-Main-nerves of leaves slender, not prominent :-Petals sparingly villous, anthers with a cluster of black 1. E. Ribes. Petals densely villous, anthers with only small glandular warts behind :--Leaves elliptic, 1.5 to 2 in. broad, shortly acuminate... 2. E. canescens. Leaves oblong, 75 in. broad, long but obtusely acuminate 3. E. dasythyrsa. Main-nerves of leaves prominent :-Branches slender, leaves lanceolate acuminate, flowers densely villous 4. E. Scortechinii. Branches stout, leaves suddenly acuminate, flowers glabrous or slightly pubescent only .. 5. E. penangiana. Leaves coriaceous :--Panicles long, leaves moderately thick :-Leaves acute or cuneate at base, main-nerves conspicuous, .. 6. E. pergamacea. bracteoles as long as the pedicels

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Leaves rounded or cordate at base, main-nerves very pro-
                                                                7. E. coriacea.
        minent, bracteoles shorter than the pedicels ..
                                                            .. 8. E. angulosa.
     Panicles short, stout, leaves very thick
 Petals joined at the base into a tube (Sect. II. GRENACHERIA):-
    Leaves rusty-villous beneath, bracts of the inflorescence
                                                            .. 9. E. Lampani.
                           short, inconspicuous
   Leaves pubescent or nearly glabrous beneath, bracts of the
                                                            ... 10. E. amentacea.
    inflorescence long, often leafy, conspicuous
Inflorescence axillary:-
 Inflorescence paniculate, axillary, 1 to 2 in. long (Sect. III.
                                    .
  Inflorescence much shorter than the leaves, on very short
  racemose branchlets with many bracts (Sect. IV. MICREM-
  BELIA) :--
                                                            .. 12. E. Murtillus.
    Flowers tetramerous, leaves coriaceous
                                                            .. 13. E. parviflora.
    Flowers pentamerous, leaves chartaceous
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Species imperfectly known: 14. E. lucida. 15. E. macrocarpa.

1. Embelia Ribes, Burm. Fl. Ind. 62. t. 23 (1768). An evergreen climbing shrub; branches pale brown, with thick bark studded with conical protuberances; branchlets pale brown, smooth, lenticellate. Leaves entire, chartaceous; elliptic or elliptic-lanceolate, obtusely acuminate at apex, cuneate at base; glabrous above, glabrous or minutely pubescent beneath, glandular dots scattered, sometimes obscure; margin generally recurved; 2 to 3 in. long, 1 to 1.5 in. broad; midrib slender, prominent below, generally impressed above; main-nerves obscure, irregular, slender, 12 to 14 pairs, parallel at first then curved upwards to join near the margin; secondary nerves many faint, reticulations very obscure; petiole 3 to 5 in. long, bordered by the crisped edges of the decurrent blade. Inflorescence a large terminal leafy 3-pinnate grey- or rusty-pubescent panicle of racemes, the branches at first turning upwards, afterwards nearly at right angles with the rachis: bracts leafy, smaller by degrees upwards; bracteoles subulate, shorter than the slender pedicels, 05 in. long; buds small, globose; flowers white. Caluxlobes very minute, about 025 in. long, triangular-acute, ciliate, with few glandular dots; tube as long as lobes. Corolla-lobes free, elliptic, rounded at top in 2, more acute in 3, 05 in. long, ciliate, sparingly villouspubescent, apex incurved, with few prominent glandular dots. Stamens inserted on the corolla-lobes, about half-way up in 3, lower down in 2, shorter than the lobes; anthers short, 3 with parallel, 2 with divaricate, cells, both with a long black mass of glandular warts behind at the insertion of the dorsifixed filaments. Ovary ovoid, glabrous; style short, stigma capitate in 3, peltate and larger in 2. Berry globose or sometimes pyriform, red or black, glabrous, succulent, wrinkled when dry, aromatic, 1 to 15 in. in. diam., crowned with the persistent style and stigma. Retz. Obs. iv. 24; Lamk. Ill. t. 133; Roxb. Fl. Ind. i. 586; Wall. Cat. 2304; A. DC. in Trans. Linn. Soc. XVII. 129, Prod. VIII. 85 (part); Scheff. Myrs. 38; Miq. Fl. Ind. Bat. II. 1011; Dalz. & Gibs. Bomb. Fl. 137; Brandis For. Fl. 284; Kurz For. Fl. II. 101; Clarke in Hook. f. Fl. Br. Ind. II. 513; Trimen Fl. Ceyl. III. 69; Cooke Bomb. Fl. II. 84; Mez Monog. Myrs. 303; Prain Beng. Pl. 643. E. Burmannii, Retz Obs. IV. 23. E. garciniæfolia, Wall. Cat. 2304c and E; Miq. l.c. 1011; Scheff. Myrs. 40. E. sumatrana, Miq. l.c. 1012. E. glandulifera, Wight Ic. 1207; Dalz. & Gibs. Bomb. Fl. 137. Samara Ribes, Kurz in Journ. As. Soc. Beng. XLVI. 222. Ardisia tenuiflora, Bl. Bijdr. 687.

Penang: Deschamps, Curtis. Perak: Wray 420; Scortechini; King's Collector 928, 1150, 6999 (abnormal state, most of the flowers converted into leafy bracts). Malacca: Griffith (K.D.) 3550; Maingay (K.D.) 1002; Cuming 2320. Johore: Native Collector 3749. Singapore: Ridley 10643, 2803 (fruits converted into insect galls); Kurz 2965.—Distrib. India, Burma and Ceylon; Malay Islands and eastwards to South China.

Var. rugosa, King & Gamble. Branchlets dark brown, much wrinkled and with oblong lenticels. Leaves 4 to 5 in. long, 1.5 to 2 in. broad, usually thicker than the type. Racemes less pubescent than in type, the flowers often collected near the ends of the ultimate branches of the inflorescence. Stamens of 3 flowers exsert. Stigma of 2 much larger than that of 3 flowers, peltate. Berry rugose, conically tipped; pericarp thick, fleshy, with cavities.

Perak: Wray 2278, 2576, 3069; King's Collector 2512, 3001, 4040. Singapore: Ridley 10384.

We find no Malay specimens with the large glandular pits so well marked in South Indian specimens (*Embelia glandulifera*, Wight Ic. 1207). Wight's figure is not well drawn in several respects, and especially as to the nervation of the leaves, so it is not very easy to make sure about it, but there seems no reason to separate *E. glandulifera* from *E. Ribes* unless perhaps as a variety. It has usually a much shorter and fewer-flowered inflorescence.

2. Embelia canescens, Jack; Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 292 (1824). A climbing shrub with slender, villous, subflexuose branches. Leaves entire, chartaceo-membranous; elliptic, shortly acuminate at apex, rounded or sub-cordate at base, glabrous or slightly pubescent and shining above, canescent beneath; glandular dots many, not prominent, in the areoles of the reticulations; 2 to 3.5 in. long, 1.5 to 2 in. broad; midrib prominent, impressed above, villous beneath; main-nerves about 10 pairs, irregular, curving upwards to join at some distance from the margin; secondary nerves many, slender,

reticulations irregular; petiole 3 to 4 in. long, bordered above by the prominently crispate edges of the decurrent blade, rugose beneath-Inflorescence a slender terminal 3-pinnate leafy panicle of distant comparatively few-flowered racemes, 4 to 8 in. long; rachis and its branches densely rusty-villous; bracts leafy below, spathulate above, bracteoles subulate, deciduous, about half as long as the 05 to 1 in. long pedicels which are longer in fruit; buds very minute, globose. Calyx-lobes very small, triangular, pubescent; tube as long as lobes. Corolla-lobes oblong. free, blunt, 06 in. long, densely villous without, papillose within and glandular-dotted. Stamens shorter than the corolla-lobes, inserted near their base; anthers rounded, warted with inconspicuous glands behind at the insertion of the dorsifixed filaments. Ovary in & flower rudimentary. Berry globose, somewhat conical above, rugose when dry, crowned with the remains of the persistent style, 2 in. in diam. Wall. Cat. 2311; A. DC. Prod. VIII. 85; Scheff. Myrs. 42; Miq. Fl. Ind. Bat. II. 1012; Clarke in Hook. f. Fl. Br. Ind. III. 514; Mez Monog. Myrs. 305.

Penang: Jack; Porter. Perak: Ridley 7172 (part). Malacca: Maingay (K.D.) 1004. Singapore: Goodenough 2804; Hullett 115.

3. Embelia dasythyrsa, Mig. Fl. Ind. Bat. Suppl. 573 (1862). A slender climbing shrub; branches minutely pubescent, striate, with prominent raised lenticels; branchlets dark, slender, rusty-villous. Leaves entire, chartaceous; oblong or elliptic-oblong, bluntly acuminate at apex, rounded at base; glabrous above, glabrous except on the midrib beneath, glandular dots scattered, obscure; 1.5 to 2 in. long, about ·75 in. broad; midrib prominent beneath, villous, impressed above, mainnerves 10 to 12 pairs, irregular, arching upwards to meet near the margin; secondary nerves few, slender, reticulations obscure; petiole ·1 to ·2 in. long, channelled above. Inflorescence a long, 3-pinnate, leafy panicle of long slender many-flowered racemes, rachises minutely pubescent; bracts leafy, bracteoles subulate, minute, much shorter than the 'I in, long very slender pedicels; buds globose shaggy, flowers grey, Calyx-lobes minute, about 03 in. long, triangular, ciliate; tube shorter than lobes. Corolla-lobes free, ovate-spathulate, about 06 in. long, blackgland-dotted, densely covered with short moniliform hairs. Stamens less than half the length of the corolla-lobes, inserted at the base; anthers reniform, with inconspicuous glandular warts on the back at the insertion of the dorsifixed filaments, which are almost shorter than the anthers. Ovary ovoid, style very short, stigma in 3 small capitate, in 2 peltate, large. Berry red or black, 15 in. in diam., globose or slightly pyriform, wrinkled when dry, tipped by the persistent style and stigma. Scheff. Myrs. 42; Mez Monog. Myrs. 305.

Perak: Wray 1924; Scortechini 498; King's Collector 776, 4103, 4375, 5102, 5762, 6640, 8583, 10024, 10701, clinging to trees in dense jungle at low levels. Selangor: Ridley 7572. Singapore: Hullett 118.—Distrib. Bangka, Teysmann Hort. Bogor. No. 3189, at Djeboes.

Only one very poor specimen of the type (Teysmann's) is available, but from an examination of it and from Miquel's description it seems to be right to refer the Peninsular plant, which we had considered new, to this species.

4. Embelia Scortechinii, King & Gamble, n. sp. A climbing shrub (?); branches slender; ultimate branchlets reddish, rusty-villous. Leaves entire, chartaceous; elliptic-lanceolate, long acuminate at apex. narrowed at base; glabrous above, grey-pubescent on the nerves beneath and with minute white scales, glandular dots obscure; 4 to 5 in. long, 1.5 to 2 in. broad; midrib very prominent, impressed above; main-nerves about 8 pairs, prominent, slender, curving upwards to and along the margin; reticulations many, prominent on the upper surface; petiole ·2 in. long, pubescent. Inflorescence of slender rusty-villous panicles of long racemes, the panicles 7 to 10 in. long, racemes 3 to 6 in.; rachis hirsute, somewhat angular; bracts deciduous, bracteoles very minute, subulate; buds very small, globose. Calyx-lobes ovate, rounded, very minute, the edges ciliate with long moniliform hairs, tube very short. Corolla-lobes oblong, acute, '05 in, long, shaggy with long moniliform hairs. Stamens shorter than the corolla-lobes; anthers ovate, cordate, with two prominent papillose warts behind at the insertion of the dorsifixed very short filaments. Ovary ovoid, style conical. Berry not known.

PERAK: Scortechini.

This interesting species is characterised by the abundant moniliform hairs on the flowers, longer and more conspicuous than in other species.

5. Embelia penangiana, Mez Monog. Myrs. 311 (1901). A climbing shrub, stem reaching about 1 in. in diam.; branches stout; ultimate branchlets red, striate, lenticellate. Leaves entire, chartaceous; elliptic, shortly acuminate at apex, narrowly cuneate at base; glabrous, not gland-dotted; 3.5 to 4.5 in. long, 1.5 to 2 in. broad; midrib prominent, impressed above; main-nerves 10 to 12 pairs, irregular, slender, at about two-thirds of a right angle with the midrib at first then arching upwards to join near the margin; secondary nerves similar but less prominent, reticulations many; petiole 5 in. long, slender, edged by the crispate decurrent margins of the blade which are often connivent above. Inflorescence a terminal 3-pinnate leafy panicle, 6 to 9 in. long, of slender racemes; rachis slightly pubescent, main branches at about half a right angle with rachis; peduncles about 1 in. long, upper branches and branchlets usually at right angles; bracts lanceolate spathulate, leafy, deciduous;

bracteoles subulate, as long as or rather longer than the very short, under 05 in long pedicels; buds very small, globose, flowers red. Calyx-lobes orbicular, glandular-ciliate, 05 in long, connate to the middle, not gland-dotted. Corolla-lobes 5, free, ovate, rounded at apex, 075 to 1 in long, slightly pubescent without, papillose within, not gland-dotted. Stamens of 3 flowers equal to or longer than the corolla-lobes, of 2 flowers shorter than them, inserted near the base of the lobes; anthers oblong, emarginate, with minute black warts behind at the insertion of the dorsifixed filaments. Ovary ovoid, glabrous, style very short, stigma peltate. Berry globose, red, tuberculate and corrugate, 1 in in diam., fruiting pedicels as long as berry. Embelia Ribes var. penangiana, Oliv. in Hook. Ic. Pl. t. 1597.

Penang: Curtis 306. Perak: Wray 1375, 1409; Scortechini; King's Collector 3637, 10739.

A well-marked species, distinguished by the fairly prominent nerves of the leaves, the very short pedicels, and the absence of glandular dots.

6. Embelia Pergamacea, A. DC. Prod. VIII. 85 (1844). A slender climbing shrub; branches rather thick, branchlets wrinkled and angular when dry. Leaves entire, coriaceous; oblong-lanceolate, acuminate at apex, cuneate or acute at base; glabrous, shining above, pale beneath, margins recurved, glandular dots many, hardly prominent; 3 to 5 in. long. 1.5 to 2 in. broad, midrib thick, impressed above; main-nerves slender 12 to 14 pairs, parallel but irregular, raised and conspicuous on the upper surface, leaving the midrib at about two-thirds of a right angle and joining near the edge in an intramarginal nerve; secondary nerves many, parallel to the main-nerves, reticulations obscure; petiole 3 in. long, angular, channelled above when dry by the crispate edges of the decurrent blade. Inflorescence a large terminal, pyramidal, 4-pinnate, nearly glabrous, leafy panicle with racemose branchlets and very numerous flowers; main rachis thick, flattened above, branches nearly at right angles to rachis as again are the branchlets, all angular; bracts ovate spathulate, leafy, bracteoles subulate acuminate as long as the pedicels; pedicels 05 in. long, somewhat longer in fruit; buds very small, globose, flowers light red. Calyx-lobes minute, about 04 in. long, broadly triangular, acute, glandular-ciliate, papillose on both sides, dotted with few large and small brown and black glands, tube as long as lobes. Corolla-lobes free, ovate-oblong, glandular-ciliate, glabrous without, papillose within, dotted in upper part only, 07 in. long. Stamens as long as or shorter than corolla-lobes, inserted half-way up; anthers ovate cordate, emarginate, black-warted behind at the insertion of the dorsifixed filaments. Ovary glabrous, ovoid; style thick very

short; stigma capitate. Berry globose, blue when ripe, wrinkled when dry, '06 in. in diam., crowned with the persistent style, gland-dotted. Miq. Fl. Ind. Bat. II. 1012; Scheff. Myrs. 34; Mez Monog. Myrs. 310. Ardisia pergamacea, Bl. fide A. DC.

Perak: Curtis 2029; Wray 2001; King's Collector 3658, 4678, 6412.—Distrib. Java; Borneo.

This species closely resembles *E. coriacea*, but differs in the acuminate leaves, very shining above and prominently nerved; in the papillose calyx-lobes, petals dotted only in the upper part and bracteoles as long as the pedicels.

7. Embelia coriacea, Wall. Cat. 2314 (1829). A climbing shrub; branches reaching 1.5 in. in diam.; branchlets reddish, twisted, somewhat angular, roughly lenticellate. Leaves entire, coriaceous; oblong or oblong-lanceolate, obtusely acute at apex, rounded or almost cordate or auricled at base; glabrous, more or less shining above, brownish beneath, glandular dots scattered, not prominent, margin sometimes incurved; 3 to 10 in. long, 1.5 to 4 in. broad; midrib thick, impressed above; main-nerves many, slender, not prominent, irregularly parallel, at about two-thirds of a right angle with the midrib, joining in an intramarginal faint nerve; secondary nerves many, slender, reticulations faint; petiole thick, 3 to 7 in. long, channelled when dry by the crispate edges of the decurrent blade. Inflorescence a large terminal 4-pinnate spreading leafy rusty-pubescent panicle with racemose branchlets and very numerous flowers; main rachis thick, somewhat flattened, branches nearly at right angles to rachis as again are the branchlets; bracts leafy, decreasing upwards; bracteoles minute, subulate, about half the length of the pedicels; pedicels 05 in. long; buds very small, globose, flowers grey. Calyx-lobes 5, minute, triangular, glabrous, dotted with very few (3 to 5 per lobe) brown or black glands; tube as long as lobes. Corolla-lobes free, 4-5, ovate, blunt, recurved, glabrous without, slightly papillose within, gland-dotted all over. Stamens shorter than the corolla-lobes, inserted on them about half-way up; anther-cells oblong, somewhat divaricate, with about 4 black warts behind at the insertion of the short filaments. Ovary ovoid, style very short, stigma capitellate. Berry globose, smooth, .075 to .1 in. in diam., pale, prominently gland-dotted, wrinkled when dry, crowned with the persistent base of the style. A. DC. in Trans. Linn. Soc. XVII. 135, Prod. VIII. 87; Clarke in Hook. f. Fl. Br. Ind. III. 513; Mez Monog. Myrs. 313. E. oblongata, Miq. Fl. Ind. Bat. Suppl. 573; Scheff. Myrs. 34. E. macrophylla, Bl.; Scheff. Myrs. 36.

Penang: Wallich 2314; Curtis 1047. Perak: Curtis 1307; Derry 11712; Wray 2001, 2579, 3238; Scortechini 117, 255; King's Collec-

tor 2278, 3481, 4976, 5056, 5254, 5323, 6231, 6766, 7857, 10015, 10543. PAHANG: Ridley 5828. SELANGOR: Ridley 7562. MALACCA: Maingay (K.D.) 1018; Ridley 11135. SINGAPORE: Ridley 2812.—DISTRIB. Sumatra; Java; Borneo, Beccari 767, 878, 1189, 2561, 3922; Haviland & Hose 3469.

8. Embelia angulosa, King & Gamble, n. sp. A climbing shrub: branches thick, branchlets wrinkled when dry, lenticels few. Leaves entire, coriaceous; ovate, obtuse, emarginate, glabrous, shining above. dull beneath, glandular dots pitted on both surfaces; 2 to 3.5 in. long, 1 to 2 in. broad; midrib very thick and prominent, impressed above: main-nerves 14 to 16 pairs, slender, irregular, leaving the midrib at nearly a right angle, then curved and joining near the margin, raised on upper surface; secondary nerves many, slender, reticulations obscure: petiole ·2 in. long, channelled above and bordered by the crispate edges of the decurrent blade. Inflorescence a dense terminal glabrous stiff panicle about 4 in. long and broad, of racemes, the rachises sharply angled; bracts leaf-like, spathulate, bracteoles very small, subulate: pedicels 05 in. long, thick, angular, glabrous or minutely pubescent, equal to or shorter than the bracteoles; buds globose. Calyx-lobes ovate. ciliate, minute, '03 in. long, not gland-dotted. Corolla-lobes free, ovate, acute, 075 in. long, nearly glabrous outside, papillose within. Stamens shorter than corolla-lobes, inserted one-third up, reniform, with inconspicuous black dots at the insertion of the short dorsifixed filaments. Ovary ovoid glabrous; style very short; stigma peltate. Berry red, ovoid, somewhat pyriform, ribbed and gland-dotted, glabrous, crowned with the remains of a cylindric style and capitate stigma. E. coriacea. Stapf in Trans. Linn. Soc. Ser. ii. IV. 200 (not of A. DC.)

PERAK: Wray 1524—on Ulu Batang Padang at nearly 5,000 ft.—DISTRIB. Borneo, Haviland No. 1152, on Mt. Kinabalu at 7,600 to 8,800 feet.

The description of the flowers is taken from Haviland's Borneo specimen, the rest from Wray's.

9. Embelia Lampani, Scheff. Myrs. 37 (1867). A slender climbing shrub, clinging to trees; branches reddish-brown, rough with strigose hairs, lenticellate; branchlets rusty-villous-hairy. Leaves chartaceous; oblong, obtuse or emarginate at apex, rounded or cordate at base; margins recurved, upper surface glabrous except on the midrib, lower surface rusty-villous, glandular dots many, scattered; 1.5 to 3.5 in. long, 1 to 1.5 in. broad; midrib impressed above, prominent below, villous on both sides; main-nerves many (up to 24 pairs), irregular, at about two-thirds of a right angle with the midrib, straight at first then curving

upwards to meet in a nerve more or less parallel to the margin; secondary nerves similar, reticulations many; petiole ·1 to ·2 in long, rusty-villous. Inflorescence of terminal panicles of pedunculate racemes 6 to 12 in. long, the branches often leafy, rachis and peduncles all rusty-villous; peduncles :5 to :7 in. long, pedicels slender, about :05 in. long; bracts few, leaf-like; bracteoles rather longer than the pedicels, lanceolate to spathulate; flowers small, buds globose, petals white, striate, tube red. Calyx-lobes 5-6, ovate, acute, ciliate on the edges, villous, dotted with few glands; tube as long as lobes, both together 05 in. long, longer in fruit. Corolla gamopetalous from one-third to one-half of its length; lobes oblong, obtuse, recurved, 1 in. long, sparsely gland-dotted. Stamens as long as or a little shorter than the corolla-lobes, inserted about halfway up, anthers oblong, dehiscing longitudinally, the back with black conspicuous glandular warts; filaments adnate to the corolla below point of insertion, slender, dorsifixed. Ovary rounded, glabrous, style cylindric, stigma peltate in 2, slightly lobed in 3. Berry globose, ·1 to ·15 in. in diam., black when dry, crowned with the persistent style, rugosely glandular. Clarke in Hook. f. Fl. Br. Ind. III. 514. E. villosa, Wall. Cat. 2313 (in part). Grenacheria Wallichiana, Mez Monog. Myrs. 293, fig. 49. G. Lampani, Mez l.c. 294.

Penang: Curtis 305; G. King. Perak: Wray 95, 2784; Scortechini 231; King's Collector 2483, 4210, 6849, 8134. Selangor: Ridley 10224. Malacca: Maingay (K.D.) 1003. Singapore: Ridley 10417.—Distrib. Sumatra, Korthals; Borneo, Haviland & Hose.

Haviland and Hose's Borneo specimens have rather larger flowers than, and pedicels about twice as long as, those from the Peninsula (No. 2280).

10. Embelia amentacea, Clarke in Hook. f. Fl. Br. Ind. III. 514 (1882). A slender climbing shrub; branches pale brown, velvety; branchlets cinnamomeous or rusty-villous. Leaves chartaceous; oblong or obovate-oblong, obtuse and sometimes emarginate at apex, rounded at base; upper surface sparsely pilose, under surface pubescent, pale bluishgreen, glandular dots many prominent; 2 to 3 in. long, '75 to 1 in. broad; midrib impressed above, prominent below, villous on both sides; mainnerves few, 6 to 10 pairs, irregular, at about two-thirds of a right angle with the midrib, arching upwards, branching and joining in a nerve near the margin; secondary nerves similar but more slender, reticulations not prominent; petiole '15 in. long, villous, winged by the decurrent base of the blade. Inflorescence of terminal panicles of pedunculate racemes, the branches leafy, the leaves passing gradually into oblong or spathulate conspicuous bracts; peduncles 1 to 1.5 in. long, enlarged at base; pedicels '1 in. long, supported by linear subulate bracteoles twice their

length, so that when in bud the racemes have the appearance of catkins; flowers very small, buds globose. Calyx-lobes 5, acute, ciliate on the edges, gland-dotted, tube as long as lobes, both together 05 in long. Corolla very shortly gamopetalous; lobes 5, ovate, obtuse, glabrous within, 05 in. long. Stamens very short, shorter than corolla-lobes, inserted about half-way up; anthers oblong, rounded, with black papillose warts on the back; filaments as long as anthers, dorsifixed. Ovary rounded, glabrous, conical above, style slender, stigma peltate. Berry globose, wrinkled when dry, 1 to 125 in. in diam., crowned with the persistent style and stigma, black when dry. Grenacheria amentacea, Mez Monog. Myrs. 294.

Perak: Scortechini 802; Ridley 7172 (part); King's Collector 5055, 6280, 6817, 8692—in open ground and in bamboo forests. Selangor: Ridley 7561, Native Collector 2802A, Goodenough 10555. Malacca: Griffith (K.D.) 3548.

Mez suggests that this may be a young state of Grenacheria Wallichiana. He apparently saw only Griffith's specimen. The abundant material now available clearly shows that Clarke correctly considered it as separate. The curious catkin-like young inflorescence and the more sparse leaf-venation distinguish it.

11. Embelia Ridleyi, King & Gamble, n. sp. A climbing (?) shrub; branchlets light brown, wrinkled. Leaves chartaceous; oblong, acute at apex, rounded at base; glabrous, glandular dots scattered obscure, margin somewhat recurved; 4 to 7 in. long, 1·5 to 3 in. broad; midrib thick, prominent below; main-nerves prominent below, about 12 pairs, curving upwards and meeting in a looped intramarginal nerve; secondary nerves and reticulations faint; petiole ·5 in. long, thick. Inflorescence an axillary panicle of racemes, the branches curved, distant; rachis ·5 to 1 in. long, that of racemes shorter, bracteoles minute, triangular; racemes about ·5 in. long. Calyx-lobes 4 or 5, ovate, gland-dotted, very small. Corolla and rest not seen.

SINGAPORE: Ridley 6324. It seems to come near to E. floribunda, Wall.

- $E.\ Tsjeriam\text{-}Cottam,$ A. DC. is quoted by Mez as extending from India southwards to Singapore, but we have seen no specimens from our region.
- 12. Embelia Myrtillus, Kurz in Journ. As. Soc. Beng. XL. ii. 67 (1871), and For. Fl. II. 104. A small climbing shrub (Wray); branches rough, somewhat corky, with large lenticels; ultimate branchlets densely rusty-villous. Leaves coriaceous; bifarious, broadly elliptic to almost orbicular, acute at apex with usually 3 terminal teeth, narrowed truncate or cordate at base; glabrous above, slightly villous on nerves beneath; glandular dots black, numerous, small, fewer large, scattered, especially

near the apex and along the margin, which is often recurved; 4 to 7 in. long, 3 to 6 in, broad; midrib prominent; main-nerves 6 pairs, arched upwards and joining in an intramarginal nerve; secondary nerves similar, reticulations prominent; petiole 1 in. long, villous. Flowers tetramerous, very small, in umbels or very short racemes on short axillary arrested branches, 1 to 15 in. long, shorter than the leaves; bracts minute, subulate. Calyx-lobes ovate, glandular ciliate, densely papillose within, 05 in. long, tube very short. Corolla-lobes free, oblong, rounded at apex, 1 in. long, glandular-ciliate on the edges, conspicuously marked with black, oblong or linear glands. Stamens longer than the corolla-lobes in 3 flowers, shorter in ?; anthers oblong, often cordate, with conspicuous warts at the insertion of the dorsifixed filaments which spring from the base of the petals. Ovary ovoid; style slender; stigma capitate, 4-cleft. Berry globose, red or black, 15 to 2 in. in. diam., prominently gland-dotted, tipped with the persistent style and stigma. Clarke in Hook. f. Fl. Br. Ind. III. 516; Mez Monog. Myrs. 322. Myrsine Myrtillus, Hook. Ic. Pl. t. 825. Samara Myrtillus, Kurz in Journ. As. Soc. Beng. XLVI. ii. 223.

PERAK: Scortechini 762; Wray 1565, 3818, on Gunong Bubu and Gunong Brumber, at 5,000 to 7,000 feet. Malacca: summit of Mount Ophir, Griffith (K.D.) 3542; Lobb; Ridley.—DISTRIB. Burma, Griffith.

13. Embelia Parviflora, Wall. Cat. 2307 (1829). A slender climbing shrub reaching 60 feet in length; branches and branchlets densely rustyvillous, slender. Leaves chartaceous; distichous, ovate, obtusely acute at the apex, truncate at base; glabrous except on the midrib beneath; margin slightly recurved; glandular dots many, prominent, scattered, more numerous towards the apex; .7 to 1.5 in. long, .5 to .75 in. broad; midrib prominent beneath, impressed above; main-nerves 8 to 10 pairs, slender, curving upwards towards the margin; secondary nerves slender, many, reticulations prominent; petiole scarcely 05 in. long, rusty-villous, channelled above. Inflorescence of very short axillary fewflowered subumbellate racemes, & 4-6-flowered with 15 in. long slender pedicels, 2 1-3-flowered with 05 in. slender pedicels; bracts in both minute subulate; flowers pentamerous; buds globose. Calyx-lobes oblong, fimbriate-ciliate, '05 in. long, with few (about 6) large brown glands, glandular-villous without, tube very short, ciliæ moniliform. Corollalobes ovate, rounded, ciliate, '075 in. long, '05 in. broad, with few unequalsized prominent brown glands. Stamens in 3 flowers longer than corolla-lobes, in 2 much shorter; anthers reniform, in 3 apiculate and warted at back at the insertion of the dorsifixed, rather long filaments which spring from near the base of the corolla-lobes. Ovary

rounded, glabrous; style slender, curved, stigma peltate, at any rate in $\mathfrak P$. Berry globose, red, black when dry, smooth, 15 to 2 in. in diam., surmounted by the remains of the style and stigma. A. DC. in Trans. Linn. Soc. XVII. 130 (excl. var. β), Prod. VIII. 86: Scheff. Myrs. 44; Kurz For. Fl. II. 104; Clarke in Hook. f. Fl. Br. Ind. III. 515; Mez Monog. Myrs. 324. Samara parviflora, Kurz in Journ. As. Soc. Beng. XLVI. ii. 223. Celastrinea, Griff. Itin. Notes 85, n. 1226.

Perak: Scortechini; Wray 4194—at Maxwell's Hill, Larút, 3,500 feet; Curtis 2059—on Hijan Range; King's Collector 2342, 6992—from dense forests on high hills at 3,000 to 5,000 feet.—DISTRIB. Khasia and Naga Hills; Upper Burma, Griffith (K.D.) 3545, &c.; Sumatra.

IMPERFECTLY KNOWN SPECIES.

14. Embelia lucida, Wall. Cat. 2315. Leaves 3 in. long, 1.25 in. broad, broadly oblong, suddenly narrowed at both ends, entire, glabrous, coriaceous. Racemes 1 in. long, axillary, simple, solitary or paired, rusty-villous. A. DC. Trans. Linn. Soc. XVII. 134, Prod. VIII. 87; Clarke in Hook. f. Fl. Br. Ind. III. 517; Mez Monog. Myrs. 396.

SINGAPORE: Wallich 2315.

15. Embelia macrocarpa, King & Gamble, n. sp. A strong climber, branchlets thick, nearly black, rough. Leaves coriaceous; elliptic, obtuse or shortly acuminate at apex, almost rounded at base, glabrous, margin reflexed; 6 in. long, 3 to 4 in. broad; midrib rather slender; mainnerves irregular, distant, not prominent, about 8 pairs; secondary nerves slender, obscure as are the reticulations; petiole '7 to 1 in. long, thick, bordered above by the decurrent margins of the leaves. Flowers apparently on rather short, thick racemes from the branches. Calyxlobes 4, triangular, acute, gland-dotted, under '1 in. long. Berry large, '5 to '7 in. in diam., smooth, wrinkled when dry, globose, crowned with the short remains of the persistent style. Seed with many conspicuous pits. Rest not seen.

Penang: at Marriot's Road, 1,500 feet, Curtis 1229.

The following Burmese species is here inserted, as it is found in Tenasserim and may occur further south in the Malay Peninsula.

EMBELIA GALLATLYI, King & Gamble, n. sp. Apparently a shrub; branchlets rounded, dark brown, lenticellate. Leaves ovate, acuminate at apex, truncate at base; prominently crenate dentate with blunt teeth and glands in the crenatures; glabrous on both surfaces, glandular dots few, chiefly near the margin; 1 to 14 in. long, 5 to 7 in. broad; midrib slender, impressed above; main-nerves 10 to 12 pairs; arching upwards to the crenatures; secondary nerves many, slender, reticulations prominent; petiole 1 to 2 in. long, channelled above, crispately edged. Inflorescence of axillary corymbose racemes, 10-12-flowered, rachis about 2 in. long, bracts minute subulate,

the whole minutely rusty-pubescent, pedicels slender. Calyx-lobes triangular acute ·03 to ·05 in. long, ciliate; tube as long as lobes or somewhat shorter. Corolla-lobes oblong-spathulate, ·1 in. long, ciliate, minutely pubescent, sparsely gland-dotted. Stamens longer than corolla-lobes, ·15 in., anthers oblong, cells parallel, not warted behind at the insertion of the long exsert filaments which spring from close to the base of the corolla-lobes. Ovary ovoid-conical, style short curved, stigma minute. Berry unknown.

TENASSERIM: at Moolyet, 5,000 feet, G. Gallatly No. 407. Gamble No. 7906 from Mianimukh, Chittagong Hill Tracts, without flowers or fruit, is probably this species.

4. LABISIA, Lindl.

Small shrubs, with a creeping rhizome and erect stem, resembling Pothos in appearance. Leaves few, coriaceous, entire or denticulate, sessile or petiolate, the petiole often dilated, main leaf-nerves very many, at right angles to the midrib. Flowers hermaphrodite, minute, pink, in axillary spike-like panicles, bracts very small. Calyx minute, 5-lobed. Corolla 5-lobed, lobes ovate, induplicato-valvate in bud; tube very short. Stamens 5, wrapped in the corolla-lobes; filaments very short; anthers ovoid, introrsely dehiscent, no staminodes. Ovary globose, attenuated into a short style; stigma small; ovules few, immersed in a globose central placenta. Fruit small, globose, red, 1-seeded. Seed globose, hollowed at the base; albumen smooth; embryo cylindric transverse.—Distrib. About 4 species, all of the Malay Peninsula and Archipelago.

.. 3 L. longistyla.

1. Labisia pumila, Benth. & Hook. f. Gen. Pl. II. 645 (1876). A semi-herbaceous undershrub, with rooting stems and leaves not jointed at their insertion but decurrent into them. Leaves bluish-green, elliptic-lanceolate, acuminate, narrowed at the base, and more or less decurrent on the petiole; crenately toothed, or sometimes nearly entire; blade 5 to 8 in. long by 1 to 2.5 in. broad; midrib thick, often rusty-pubescent; main-nerves extremely numerous, nearly at right angles to the midrib, parallel, slender, anastomosing towards the margin, and

and regular

then producing an elegant network; under-surface with brown glandular scales; petiole 1 to 3 in., enlarged at the base, often minutely rustypubescent. Flowers pink, in a spike-like, long-stalked, ferruginoustomentose panicle of small corymbose bracteate clusters; peduncles of corymbs 1 in, long or shorter, sometimes none; bract linear-subulate, ·05 to 1 in. long.; pedicels ·05 to 1 in., slender, with minute bracteoles. Calux-lobes triangular, acute, 025 in. long, densely glandular. Corollalobes ovate, with linear glands, glabrous. Stamens infolded in the corolla: filaments very short: anthers oblong-linear, apiculate, with several hard round or linear black warts on the back. Ovary rounded, pubescent, ending in a subulate angular style with minute notched stigma. Fruit a globose red berry, about 15 in. in diam., ribbed and with prominent elongate glands, surmounted by the persistent style. Mez Monog. Myrs. 171 (var. genuina). L. pothoina, Lindl. in Bot. Reg. 31, t. 48; Clarke in Hook, f. Fl. Br. Ind. III, 518; Stapf in Trans. Linn. Soc. Ser. 2, IV. 200; Ardisia pumila, Blume Bijdr. 688; A. DC. Prod. VIII. 137; Miq. Pl. Jungh. 199 and Fl. Ind. Bat. II. 1028; Scheff. Myrs. 92. A ? spicata, Wall. Cat. 2273; A. DC. in Trans. Linn. Soc. XVII. 135.

SINGAPORE or PENANG: Walker, 165. PENANG: Curtis 1192; Kunstler 1159. PERAK: Scortechini; Wray 753A. MALACCA: Maingay 1013 (K.D.); Stoliczka. SINGAPORE: Ridley 1804.—DISTRIB. JAVA: Forbes 238, 474. In dense moist forests on the lower slopes of hills.

Var. lanceolata, Scheff. l.c. 93. Leaves elliptic-lanceolate, acuminate, somewhat rounded at base; not, or very slightly, decurrent; blade 5 to 8 in. long, by 1.5 to 3.5 in. broad; petiole 2 to 5 in. long not winged. Inflorescence more slender, bracts often longer than the peduncle of the corymb. Clarke in Hook. f. Fl. Br. Ind. III. 518; Mez Monog. Myrs. 172. L. pothoina, N. E. Brown (non Lindl.) in Ill. Hort. XXXII. 95 tab. 561.

Penang: Hullett 201. Pahang: Goodenough 2799. Singapore: Lobb 61; Kurz; T. Anderson 196.—Distrib. Sumatra, Korthals; Borneo, Motley 1250, Haviland.

Var. alata, Scheff. l.c. 93. Leaves thin ashy-green above, dark green below, elliptic oblong, rounded at top or obtusely acuminate; gradually or suddenly narrowed into a broad wing decurrent on the petiole; crenate glands and scales few or none; 6 to 16 in. long, 2 to 4 in. broad. Inflorescence with the corymbs usually more closely congested and on a shorter peduncle; flowers somewhat smaller, bracts usually longer than the corymb peduncle, flowers white or pink. Mez Monog. Myrs. 172. L. alata, N. E. Brown in Ill. Hort. XXXIII. 123, t. 605.

Perak: Wray 753B, 824, 2482, 2737; Scortechini; King's Collector

980, 2815, 2882, 2891, 2942, 2974, 2999, 3376, 8325, 10949. SINGAPORE: Lobb 313.—DISTRIB. Sumatra, Korthals; Borneo.

2. Labisia paucifolia, King & Gamble, n. sp. A small semiherbaceous undershrub, 10 to 15 in. high; the stems striate, round, minutely purplish-brown-pubescent, bearing rarely more than 3 to 4 leaves. Leaves long-petioled, the blade ovate or orbicular-ovate. rounded at top into a bluntly acute point, rounded at base and then very shortly decurrent; entire or very minutely crenate; 2.5 to 4 in. long, 1.5 to 3in. broad; main-nerves slender, numerous, more or less parallel, joining near the edge; petiole 1 to 2 in. long, thickened at the base and decurrent into the stem. Inflorescence 1.5 to 2.5 in. long, consisting of axillary, short-peduncled, rusty-pubescent racemes, the flowers reflexed, single or in few-flowered sessile clusters; pedicels ·05 to ·1 in. long, with short subulate bracts of equal length. Calyxlobes ovate-acuminate, covered without with numerous glands, .075 in. long; tube short, about half the length of lobes. Corolla-lobes oblongacuminate, 125 in. long, glabrous. Stamens closely enfolded; filaments very short; anthers hastate, long apiculate, glandular warted behind, ·1 in. long. Ovary rounded, pubescent; style about ·04 in. long, angular, oblique; stigma minute, notched. Fruit a dark red berry, 1 in. in diam., striate and with oblong glands.

Perak: Scortechini; Wray 4102; King's Collector 8078. In open forest at 3,000 to 5,000 feet.

Besides the characteristic leaves, the acuminate petals and hastate long apiculate anthers make this species recognisable, though the leaf-venation resembles that of *L. pumila*.

3. Labisia longistyla, King & Gamble, n. sp. An undershrub about 2 feet high; stem thick, rusty-brown, minutely pubescent. Leaves sessile, oblong, entire, rounded at apex and very slightly emarginate, decurrent below in a broad wing for about \(\frac{1}{6} \) of their length; prominently glandular-pitted above and with rusty glandular scales below; 7 to 12 in. long, 3 to 4 in. broad; midrib very thick, prominent, glandular scaly; main-nerves at right angles to midrib, extremely numerous, straight, parallel, anastomosing towards the edge which is slightly recurved. Inflorescence a raceme-like rusty-pubescent panicle of single flowers or shortly peduncled few-flowered secund corymbs, 8 to 9 in. long, the main peduncle about 4 in.; corymb-peduncles curved, angled, \(\frac{1}{2} \) to \(\frac{1}{2} \) in. long; bracts very short, subulate; pedicels striate, about \(\frac{1}{2} \) in. long; bracteoles minute. Calyx-lobes ovate, acute, glandular without, tube rather shorter than lobes, together \(\frac{1}{2} \) 6 in. long. Corolla and stamens unknown. Ovary rounded, pubescent, crowned by a

filiform ·2 in. long style. Fruit a globose berry, with a conical top and the remains of the style, glabrous, striate with linear-oblong prominent glands.

Perak: Wray 1590. Selangor: Curtis 3750, at 3,000 to 4,000

feet.

5. Ardisia, Swartz.

Small trees, shrubs or semi-herbaceous undershrubs, evergreen, generally all parts with pellucid glands which often dry black. Leaves sessile or petiolate, membranous to coriaceous, entire crenate or serrate. Flowers regular, pedicellate, hermaphrodite; inflorescence various. Calyx inferior, 4-6-lobed, the lobes free or overlapping to the right; tube very open, as long as or shorter than the lobes. Corolla red white or spotted, often waxy in appearance, 4-6-lobed, the tube often very short; the lobes overlapping to the right, often twisted. Stamens equal in number to, and opposite to, the corolla-lobes, sometimes long and narrow, usually sagittate-lanceolate and apiculate, sometimes very small, fixed to the corolla-tube by filaments usually short and broad; generally opening by slits, occasionally by terminal pores, in A. littoralis septate; dehiscence always introrse. Ovary globose, sometimes narrowed into the style, more often almost depressed; style usually filiform, rather long; stigma punctiform; ovules few or many, immersed in a globose placenta. Fruit a globose, rarely obovoid, berry, usually surmounted by the remains of the style, fleshy, red or purple or black, often spotted; endocarp crustaceous; 1-seeded. Seed solitary, large, globose, hollowed at the base; albumen pitted or ruminate; embryo cylindric horizontal.—DISTRIB. 200 to 250 species, all of tropical or sub-tropical regions in both worlds, scarce in Africa.

Leaves entire or crenate, never serrate:—

Leaves entire, or if crenate without glands in the crenatures:—

Calyx-lobes not, or only slightly, overlapping to the right, usually small:—

Inflorescence lateral:—

Inflorescence short-peduncled, shorter than the leaves (I. Pimelandra):—

Leaves entire; inflorescence on wood of current and past years:—

Leaves over 6 in. long; nerves conspicuous:—

Leaves nearly glabrous beneath; main-nerves less than 20

.. 1. A. pachysandra.

Leaves densely tomentose beneath; main-nerves more than 20

.. 2. A. Teysmanniana.

Leaves under 6 in. long:-		
Leaves shining, nerves obscure;		
flower-buds very short, rounded	3	A. chrysophyllifolia.
Leaves not shining, nerves con-		
spicuous; flower-budslong, acuminate Leaves crenate; inflorescence on wood of	4.	A. solanoides.
current year	5	A. fulva.
Inflorescence long-peduncled (II. Akosmos):—	٠	a. java.
Peduncles slender, under 1 in. long, pu-		
bescent; leaves membranous	R	A. ferruginea.
Peduncles thick, 3 to 3.5 in. long, glabrous;	0. 1	1. jerragmou.
leaves coriaceous	7	4. lankawiensis.
Inflorescence terminal:—		1. (00,(10,00,00,00,00,00,00,00,00,00,00,00,00,0
Style exsert in the bud (III. STYLARDISIA):—		
Leaves membranous; inflorescence short,		
few-flowered	8	4. andamanica.
Leaves chartaceous or coriaceous, inflor-	٠	2,
escence elongate, many-flowered :—		
Leaves without a conspicuous intra-		
marginal nerve:—		
Calyx-lobes 05 in long or under,		
usually glabrous:—		
Leaves coriaceous :—		
Leaves not thickly scaly beneath :-	_	
Nerves of leaves obscure, leaves		
dark when dry	9. 4	1. tuberculata.
Nerves of leaves prominent,		
leaves pale when dry	10. 4	1. ophirensis.
Leaves thickly scaly beneath:—		
Leaves broad; main-nerves very		
many, prominent, over 24 pairs 1	L1. Z	l. labisiæfolia.
Leaves narrow; main-nerves		
fewer, obscure, 20 pairs	12. 🗸	1. montana.
Leaves chartaceous :—		
Panicles slender, elongate; leaves		
usually small, main-nerves at		
about 60° to midrib	13. z	l. sinuata.
Panicles rather thick, compact;		
leaves generally large, main-		
nerves at about 75° to midrib	L4. z	l. colorata.
Calyx-lobes 2 in. long, ferruginous		
pubescent 1	lo. A	. crassa.
Leaves with a conspicuous intramarginal		
nerve	lb. A	. ріатусіана.
Style not exsert in the bud (IV. ACRARDISIA):—		
이 얼마의 어느 그리고 하게 하면 나는 것 같아요. 그래 하는 사람들이 살아가는 것 같아 하는 것이 되었다. 그리고 하는 것이 없는 것 같아.		
Branches of the inflorescence racemose;		
buds long, slender	A	. porosu.
Branches of the inflorescence umbellate;	0 1	Aim ama am a
buds short, conical	.o. A	. uwergens.
usually large and broad :—		
Inflorescence terminal (V. Timopsis):—		

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Leaves under 6 in. long; panicle compact,
    pedicels slender, flowers rather small; berry
                                           .. 19. A. sumatrana.
    globose, ·2 in. in diam. ..
    Leaves usually over 6 in. long; panicle
    spreading, pedicels stout, flowers large;
    berry depressed, over 25 in. in diam. .. 20. A. lanceolata.
  Inflorescence lateral (VI. TINUS):-
     Anthers septate : leaves coriaceous, obovate,
                                          .. 21. A. littoralis.
    inflorescence short ...
     Anthers not septate :-
       Leaves usually over 6 in. long :-
         Leaves 8 to 15 in. long, elliptic, buds
                                         .. 22. A. Kunstleri.
         ·25 in long .. ..
         Leaves 5 to 10 in. long:-
           Main-nerves at about an angle of 60°
           with midrib:-
             Buds '4 in. long or more; leaves
             coriaceous :---
               Buds conical; calyx-lobes
               rounded; raceme glabrous
                                            .. 23. A. solanacea.
               Buds rounded; calyx-lobes emar-
               ginate, raceme rusty-pubescent 24. A. lurida.
             Buds 3 in. long only, rounded;
             Main-nerves at only about 30° with
           the midrib; calyx-lobes emarginate 26. A. Scortechinii.
       Leaves usually under 6 or even 5 in.
       long:-
         Leaves few-nerved; inflorescence long,
                                           .. 27. A. pendula.
                                 inflorescence
         Leaves many-nerved;
          short, 1-5-flowered
                             .. .. 28. A. Hullettii.
      Anthers not known; leaves 7 to 10 in. long,
     under 2.5 in. broad; main-nerves at an angle
     of 80° with midrib in an elegant network
      with secondary nerves and reticulations .. 29. A. oblongifolia.
      Anthers not known; leaves elliptic or elliptic-
     ovate, acuminate, 4.5 to 6.5 in. long; calyx-
      lobes 4; inflorescence apparently terminal.. 30. A. tetrasepala.
      Anthers not known; leaves 3 to 5 in. long,
      under 1.5 in. broad, acuminate, flowers 2 .. 31. A. biflora.
      Anthers not known; leaves 4 to 6 in, long,
      ·7 to ·9 in. broad, linear-lanceolate; flowers
      in peduncled axillary umbellate racemes,
      about 5 to 8
                                           .. 32. A. tahanica.
Leaves crenate, with glands in the crenatures
(VII. CRISPARDISIA):-
  Calyx-lobes more or less gland-dotted :-
    Calyx-lobes oblong, obtuse or obtusely acute :-
      Calyx-lobes lingulate, over .25 in. long,
      sparsely dotted; inflorescence short; leaves
      lanceolate, more or less villous.. .. 33. A. villosa.
      Calyx-lobes under ·1 in. long, prominently
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dotted; inflorescence long; leaves oblong,
     glabrous, pale
                                             . 34. A. virens
                       . . .
   Calvx-lobes ovate, more or less acute:-
     Inflorescence axillary, racemose or umbel-
     late:-
       Racemes or umbels in the axils of upper
       leaves only :-
          Leaves over 5 in. long, crenatures broad,
          very shallow, rounded:-
            Leaves membranous, pedicels slender 35. A. Wrayi.
            Leaves coriaceous, pedicels thick .. 36. A. minor.
          Leaves under 4 in. long, crenatures
          narrow, almost dentate
                                            .. 37. A. perakensis,
        Racemes in the axils of all or nearly all
                                             .. 38. A. Meziana.
        the leaves, crenatures narrow
      Inflorescence terminal or pseudo-terminal:—
        Inflorescence of a single sessile, umbellate
        raceme; leaves 4 to 8 in. long
                                             .. 39. A. Ridleyi.
        Inflorescence usually of panicled racemes:
                                         .. 40. A. crenata.
        leaves 2 to 4 in. long
  Calyx-lobes not gland-dotted; inflorescence ter-
  minal or pseudo-terminal:-
    Branches of inflorescence short, not more than
    1 in. long; leaves 2 to 4 in. long
                                            .. 41. A. rosea.
    Branches of inflorescence 2 to 3 in. long;
    leaves 4 to 6 in. long
                                            .. 42. A. longepedunculata.
Leaves acutely and prominently serrate occasionally
abortive (VIII. BLADHIA) :-
  Inflorescence long, reaching 6 to 8 in.; leaves
  large, nearly or quite sessile
                             .. 43. A. Maingayi.
  Inflorescence short, under 2.5 in.; leaves
  petioled :-
    Inflorescence 1.5 to 2.5 in. long; anthers
    mucronate; leaves under 3 in. long .. 44. A. theæfolia.
    Inflorescence under 1.5 in. long; anthers
    emarginate: leaves over 4 in. long:-
      Leaves and branchlets fulvous-villous;
      flowers pink; ovary and base of style
                                             .. 45. A. odontophylla var. Lobbii.
      pubescent
      Leaves and branchlets glabrous; flowers
      white; ovary and base of style glabrous .. 46. A. bambusetorum.
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1. Ardisia pachysandra, Mez Monog. Myrs. 97 fig. 14 A-E (1901). A large shrub or small tree reaching to 40 to 50 feet high, and 6 to 10 in. diam.; branches with pale brown bark, marked with decurrent lines below the leaves or leaf-scars; branchlets thickly rusty-villous at the ends. Leaves membranous; oblong or slightly obovate, acute at apex, cuneate at base; glabrous above, except on the midrib which is sometimes minutely pubescent, glabrous or slightly pubescent beneath; entire, glands numerous near the margins; 6 to 10 in. long, 1.5 to 3 in. broad; midrib thick, slightly impressed above; main-nerves

14 to 20 pairs, irregular, 4 to 5 in. apart, starting at an angle of about 60°, then slightly arching to and along the margin; petiole 4 to 6 in. long, pubescent, wrinkled, slightly channelled above. Inflorescence of small, axillary, sessile or shortly peduncled, umbels or corymbs; peduncles 1 in long flowers 6 to 8; pedicels slender, pubescent striate. ·4 in. long; bracts minute, subulate, densely pubescent, deciduous. Calux-lobes ovate, rounded, pubescent, 2 in, long, slightly overlapping to the right, ciliate, gland-dotted especially near the tip. Corolla-lobes boat-shaped, broadly ovate, shortly acuminate, 3 in. long, glabrous, white, faintly nerved, dots very few, revolute in flower; tube short. Stamens a little shorter than corolla-lobes: anthers ovate. cuspidateacuminate, much gland-dotted and warted at the back on the connective: filaments thick. Ovary rounded, glabrous, style subulate, as long as the anthers. Berry 2 to 4 in. in diam., globose, glabrous. pale. Mursine pachusandra, Wall. in Roxb. Fl. Ind. ed. Carev & Wall. II. 297 : Wall Cat. 2284 : A. DC. in Trans. Linn. Soc. XVII. 111. Pimelandra Wallichii, A. DC. in Ann. Sc. Nat. 2. XVI. 88: Prod. VIII. 106: Deless. Ic. Sel. V. 14. t. 31; Scheff. Myrs. 94; Mig. Fl. Ind. Bat. II. 1029: Clarke in Hook, f. Fl. Br. Ind. III. 531.

Penang: Wallich 2284; Porter; Curtis 1156, 3164, 3181, 3737.

Malacca: Griffith (K.D.) 3597; Maingay (K.D.) 1006. Perak: Wray 1358; King's Collector 5995, 7194.—Distrib. Borneo (?).

2. Ardisia Teysmanniana, Scheff. in Tijdschr. Ned. Ind. XXXI. 368 and in Flora 253 (1870). A large shrub or small tree; branchlets brown, with wavy longitudinal lines passing downwards from the sides of the bases of the petioles, lenticels numerous, innovations densely ferruginous-pubescent. Leaves entire, chartaceous; oblong or slightly oboyate-oblong or oblong-lanceolate, acuminate at the apex, alternate and sometimes abruptly rounded at base; glabrous above, densely ferruginous-tomentose beneath; glands very numerous, small, evenly distributed over the whole under surface; 6 to 11 in. long, 1.5 to 3 in. broad; midrib thick, prominent beneath; main-nerves 25 to 30 pairs, 3 to 4 in. apart, starting at an angle of 60°, at first straight, then curving to meet in the margin in a looped nerve, raised beneath as are the few secondary nerves and the many oblique reticulations; petiole very thick, 5 to 6 in. long, usually bordered by the decurrent margins of the blade which are again revolute. Inflorescence of axillary pedunculate umbels or corymbs; peduncles in flower 1 to ·2 in. long, in fruit sometimes up to ·5 in., 4-5-flowered; pedicels slender, 4 in. long, densely rusty-pubescent, striate; bracteoles linear-subulate, deciduous. Calyx-lobes ovate, rounded, pubescent, ·1 in. long, ciliate. Corolla-lobes ovate-acuminate, ·2 in. long, softly

pubescent, glands inconspicuous, tube very short. Stamens nearly as long as corolla-lobes; anthers ovate, cuspidate-acuminate, concave and warted on the connective at the back, '175 in. long; filaments slender, '05 in. long, glabrous. Ovary rounded, glabrous; style slender, subulate, as long as stamens. Berry globose, slightly depressed, '3 in. in diam., black-gland-dotted, faintly ribbed. Mez in Monog. Myrs. 97. Pimelandra Teysmanniana, Hook. f. in Benth. & Hook. f. Gen. Pl. II. 64. Pimelandra Wallichii var. Teysmanniana, Clarke in Hook. f. Fl. Br. Ind. III. 531.

MALACCA: Maingay (K.D.) 1007. SINGAPORE: Cantley; Ridley 2800, 5573, 6788.—DISTRIB. Bangka.

This species is easily distinguished from the former by having many more and much closer nerves to the leaves, and by the dense rusty tomentum.

3. Ardisia chrysophyllifolia, King & Gamble, n. sp. A tree, branchlets reddish-brown, innovations densely ferruginous-pubescent. Leaves entire, coriaceous; oblong-lanceolate, obtusely acute at apex. narrowed at base; glabrous on both surfaces; glands scattered, visible on the under surface; 4 to 6 in. long, .75 to 1.25 in. broad; midrib thick, prominent; main-nerves many, more or less parallel, inconspicuous, meeting, with the secondary nerves, in a wavy intramarginal nerve, reticulations fine; petiole 4 to 5 in. long, glabrous, channelled above and edged by the decurrent margin of the blade. Inflorescence of small, axillary, sessile or shortly peduncled, umbels of up to about 12 flowers; pedicels slender, 2 in, long, ferruginous-pubescent; bracts minute, triangular; buds very short, rounded. Calyx-lobes 5, ovate, minutely ciliate, pubescent and scaly outside, dotted with many conspicuous golden glands, '05 in. long, tube a little shorter. Corolla-lobes ovate, concave, sparsely glandular, glabrous, '08 in. long; tube none or very short. Stamens a little shorter than the corolla-lobes; anthers ovate acuminate. black-gland-dotted behind; filaments short. Ovary rounded, glabrous; style subulate, '05 in. long. Berry globose, somewhat depressed, covered with round and elongate glands, 15 in. in diam.

PERAK: at Lower Camp, Gunong Pateh, 3,400 feet, Wray 483, 1118, 1182.

4. Ardisia solanoides, King & Gamble, n. sp. A small shrub, 3 to 4 feet high; branches slender, smooth, dark brown; branchlets glandular-hirsute, marked by obscure raised lines from the sides of the bases of the petioles. Leaves entire, membranous; elliptic, bluntly long caudate-acuminate at apex, attenuate at base; glabrous above, more or less glandular-hirsute beneath; glandular dots many, scattered, prominent; 2.5 to 3.5 in. long, 75 to 1.25 in. broad; midrib slender,

raised beneath; main-nerves 8 to 9 pairs, raised, at an angle of 60° with the midrib, the lowest pair more oblique, nearly straight, meeting at about two-thirds of the way to the margin in a looped intramarginal raised nerve, reticulations obscure; petiole 15 in. long, bordered by the decurrent margins of the blade. Inflorescence of sessile, axillary, umbellate, nearly glabrous racemes of about 4 to 6 flowers, racemes hardly 1 in. long; bracteoles oblong-lanceolate, gland-dotted, 1 in. long; pedicels slender, 3 to 4 in. long, slightly clavate; buds conical, acuminate, 3 in long; flowers white with a blueish tinge. Calyx-lobes 4 to 5, very short, rounded, scarious and ciliate on the margins, gland-Corolla-lobes ovate below, caudate-acuminate above, twisted and reflexed in flower, 3 in. long, sparsely pale-glandular-punctate. Stamens nearly as long as corolla-lobes, lanceolate, membranous at tip, with two lines of glandular dots on the back of the connective. Ovary rounded; style very slender, as long as stamens. Berry bright red, glossy, 25 in. in diam. when dry.

PERAK: in dense jungle on rich soil, at 500 to 800 feet, King's Collector 4254.

This species very closely resembles Antistrophe caudata, but is at once distinguished by the fact of the corolla-lobes overlapping to the right instead of to the left. The flowers somewhat resemble those of Ardisia porosa.

5. Ardisia fulva, King & Gamble, n. sp. Apparently a shrub; branchlets rather thick, usually marked by raised lines descending from the bases of the leaves; innovations densely tawny-villous; leafbuds lanceolate, densely pubescent. Leaves coriaceous; elliptic-oblong or elliptic-lanceolate, shortly acuminate at apex, somewhat rounded at base; glabrous or slightly scaly above, thickly tawny-villous beneath; glandular dots few, scattered, obscure, in the areoles of the minor nerves; crenate, especially in the upper two-thirds; 4 to 7 in. long, 1 to 2 in. broad; midrib slender; main-nerves 20 to 24 pairs. irregular, arching upwards and joining in an intramarginal nerve; secondary nerves slender, faint, reticulations curved; petiole 4 to 6 in. long, winged by the decurrent edges of the blade. Inflorescence of short 1 to 1.5 in. long, densely tawny-pubescent, drooping, corymbs in the axils of tawny, leaf-like, often nearly 1 in. long, bracts from the young branches below the end leaves; peduncles about 7 in. long, slender, pedicels slender, up to 5 in. long; bracteoles subulate, short, tawny; buds ovate, ·2 to ·25 in. long. Calyx-lobes ovate, thin, villous without, ciliate, ·1 to ·15 in. long, marked with prominent black dots, recurved in flower; tube short. Corolla-lobes obovate, obtuse, ·2 to ·25 in. long, oblique, unequal, marked by prominent round or oblong black dots, tube short. Stamens

a little shorter than the corolla-lobes, acuminate, with 2 rows of prominent black dots behind the anthers; filaments short. Ovary ovoid, surmounted by a short, 1 in. long, subulate style, glabrous. Berry 2 in. in diam., black when dry, ribbed.

KEDAH: on Langkawi Island, Curtis 2133. Penang: Ridley 10216. Perak: Ridley 8269.

6. Ardisia ferruginea, Mez Monog. Myrs. 108 (1901). A shrub (?); branchlets slender, densely ferruginous-tomentose. Leaves membranous; linear- or oblong-lanceolate, bluntly acute at apex, rounded at base; glabrous or slightly rusty-scaly above, rusty-pubescent beneath; entire; glands not apparent; 3 to 4.5 in. long, '75 to 1 in. broad; midrib slender, nerves very faint; petiole '1 to '2 in. long, rusty-pubescent. Stipules small, linear-falcate. Flowers in densely ferruginous-pubescent, bipinnate panicles in the axils of upper leaves; peduncles '5 to '75 in. long; bracts linear subulate about '15 in.; pedicels slender, '1 to '2 in. long; bracteoles minute; buds conical. Calyx-lobes ovate, obtuse, ciliate, connate to rather over one-third, with wavy glandular dots. Corolla-lobes shortly connate at the base, broadly and obliquely ovate, short acuminate, gland-dotted. Stamens a little shorter than the corolla-lobes; anthers large, ovate, gradually acute, scarcely punctate; filaments very short. Ovary ovoid, glabrous, style slender.

Johore: at Kampong Sunpai, Lake & Kelsall (Ridley 4032).

This species does not seem to differ very much from A. Miqueliana, Scheff. in Tijdsch. Ned. Ind. XXXI. 367, in respect to leaves, but that species has terminal and not axillary flowers.

7. Ardisia lankawiensis, King & Gamble, n. sp. A tree; branchlets smooth, glabrous, obscurely striate, with raised lines from the edges of the bases of the leaf-petioles. Leaves corraceous; elliptic or ellipticlanceolate, acuminate at apex, acute at base, glabrous; entire; glandular dots frequent near the margins; 3.5 to 5 in. long, 1.25 to 1.5 in. broad; midrib slender; main-nerves obscure, about 12 to 14 pairs, anastomosing near the margin, secondary nerves and reticulations similar; petiole ·5 to ·6 in. long, channelled above by the decurrent margins of the blade. Flowers pink, in long-peduncled, closely congested racemes in the axils of the uppermost leaves; peduncles 3 to 3.5 in. long, flattened, glabrous; pedicels 5 to 7 in. long, striate, slender; bracteoles minute, caducous. Calyx-lobes ovate, acute, ciliate, with many glands on the back, .075 in. long. Corolla-lobes ovate, acuminate, much gland-dotted, 25 to 3 in. long. Stamens a little shorter than the corolla-lobes, ovate-lanceolate, mucronate, dehiseing on the margins but more widely near the top. Ovary rounded, obscurely 5-lobed; style 2 in. long, twisted and

wrinkled. Fruit a depressed, obscurely 5-angled berry, 2 in. in diam., pericarp very smooth inside.

KEDAH: on Lankawi Island, Ridley 8313.

8. Ardisia andamanica, Kurz For. Fl. II. 108 (1877) and in Journ. As. Soc. Beng. XLVI. ii. 225. A small or medium-sized evergreen shrub reaching 15 feet high and 2 in. in diam.; branches slender with reddishbrown bark, striate when dry, branchlets glabrous. Leaves entire, membranous: oblong lanceolate, narrowly long acuminate at apex, cuneate at base; glabrous on both surfaces but with many scattered glandular dots and occasional peltate scales; 3 to 6 in. long, .75 to 1 .75 in. broad; midrib slender; main-nerves about 20 pairs, very thin and inconspicuous, at about 60° with the midrib, at first straight then arching upwards to and along the margin; petiole ·3 to ·5 in. long, channelled above. Inflorescence a loose terminal panicle 2 to 3 in, long, with few slender umbel-like racemes on ·3 to ·5 in. long, squarrose peduncles; pedicels slender, 3 in.; bracteoles small, ovate, deciduous. Calyx-lobes acute, triangular, 05 in. long, minutely ciliate at the edges, dotted with black glands; tube rather shorter than lobes. Corolla-lobes ovate, acute, ·15 in. long, glabrous, with inconspicuous nerves and few scattered round or oblong glands. Stamens a little shorter than corolla-lobes; anthers ovate, apiculate, 'I in. long, glabrous on the back or with few black glands; filaments 05 in. Ovary rounded, glabrous; style filiform, long exsert, 15 in. long. Berry round or slightly pyriform, smooth, ·3 in. in diam. Clarke in Hook. f. Fl. Br. Ind. III. 521; Mez Monog. Myrs. 110. Ardisia neriifolia, A. DC. Prod. VIII. 127 in part (not of Wall.), Trans. Linn. Soc. XVII. t. 8 (fig. only).

Malacca: Griffith (K.D.) 3570; Hullett 830; Stoliczka. Ревак: Ridley 9718; Wray 867, 943, 971, 1033; King's Collector 5692, 8064. Johore: Ridley 3717.—Distrib. Andamans, Mergui.

9. Ardisia tuberculata, Wall. Cat. 2274 (1829). A shrub, reaching 10 feet in height; branchlets smooth, stout, reddish, uppermost flattened, glabrous. Leaves entire, coriaceous; elliptic, bluntly acuminate at apex, attenuate or rounded at the base; glabrous and shining above, covered beneath with rather deciduous peltate scales, dark when dry; 3 to 6 in. long, 1 to 2 in. broad; midrib prominent; main-nerves obscure, about 15 pairs, starting at an angle of about 75° from the midrib, then arched upwards to and along the margin; secondary nerves more slender, reticulations obscure; petiole 3 to 5 in. long, thick, rough, winged by the decurrent margins of the blade. Inflorescence a lax, leafy, terminal, tripinnate, 3 to 6 in. long, panicle; rachis flexuous, flattened, often scaly; primary peduncles squarrose, 6 to 1 in. long, supported by ovate acuminate leafy bracts; secondary peduncles also squarrose,

·3 to ·5 in. long with subulate bracts; ultimate racemes umbellate, 6-8-flowered; pedicels slender, short, ·1 to ·15 in. long; bracteoles subulate; buds ovoid, obtuse, glabrous. Calyx-lobes ovate, acute or rounded, ·05 in. long; margin ciliate, dotted with black glands. Corollalobes broadly ovate, blunt, glabrous, ·1 in. long, with very few dots; tube very short. Stamens a little shorter than the corolla-lobes; anthers acute, but gland-dotted behind; filaments minute, broad. Ovary globose; style subulate, longer than the petals. Berry obovoid, smooth, ·15 to ·2 in. in diam. A. DC. in Trans. Linn. Soc. XVII. 119, Prod. VIII. 130; Miq. Fl. Ind. Bat. II. 1026; Clarke in Hook. f. Fl. Br. Ind. III. 521, except var.; Mez Monog. Myrs. 112, fig. 16. A chrysophylloides, Miq. Fl. Ind. Bat. Suppl. 574.

Penang: Wallich 2274. Malacca: Derry 394. Pahang: Ridley 1071. Johore: Ridley 6438. Singapore: Griffith (K.D.) 3564; Maingay (K.D.) 1014; Ridley 2817, 8916, 1916(A).—Distrib. Bangka Teysmann.

10. Ardisia ophirensis, Mez Monog. Myrs. 113 (1901). A shrub (?); branchlets pale brown, flattened, smooth; innovations minutely ferruginous-scaly. Leaves coriaceous; elliptic, shortly acuminate at apex, rounded or somewhat acute at base; pale and somewhat shining on both surfaces, the under covered with minute brown peltate scales; glands scattered, numerous; 3 to 6 in. long, 1.75 to 2.25 in. broad; midrib thick, prominent; main-nerves prominent, raised on both surfaces, 10 to 12 pairs, starting at an angle of about 75° with the midrib, at first straight then curving upwards to meet some way from the margin in a prominent network; secondary nerves prominent, reticulations transverse; petiole 4 to 5 in. long, thick, bordered above by the decurrent margins of the blade. Inflorescence a terminal, leafy, angular, tripinnate panicle, about 3 to 4 in. long; rachis flexuous, flattened, scaly; peduncles squarrose, about 1 in. long, supported by ovate-oblong, reflexed, leafy bracts; pedicels ·3 in. long, slender, in fruit very spreading. Calyx-lobes ovate, acute, .05 in. long, back dotted with prominent large glands. Corolla-lobes elliptic-ovate, rather oblique, shortly connate, nervose; glands few, near the apex, black. Stamens rather shorter than the corolla-lobes; anthers ovate, large, not glandular, apiculate; filaments short, slender. Ovary ovoid, glabrous; style long, subulate, exsert. Berry black when dry, 15 in. in diam., with prominent glands. A. tuberculata var. ophirensis, Clarke in Hook. f. Fl. Br. Ind. III. 522.

Malacca: Hullett 754; Ridley 621; Miller 9. On the top of Mount Ophir.

11. Ardisia labisiæfolia, King & Gamble, n. sp. A small tree; branchlets thick, slightly flattened, smooth, glabrous below, lepidote-

scaly above. Leaves coriaceous; elliptic or elliptic-oblong, shortly and rather abruptly acuminate at apex, rounded at base; glabrous above when old, when young densely covered, as is the under-surface always, with rather large reddish-brown peltate scales, margins recurved; 6 to 8 in. long, 2 to 4 in. broad; midrib thick, prominent, impressed above; main-nerves 24 to 30 pairs, irregularly spaced, at first parallel, leaving the midrib nearly at right angles, then near the margin curving upwards to and along the margin and anastomosing with the prominent secondary nerves which resemble the main ones; reticulations prominent in an elegant network, all more or less raised above when dry; petiole ·5 to ·8 in. long, thick, bordered above by the decurrent margins of the blade. Inflorescence a pyramidal, rusty-scaly, bracteate, tripinnate panicle, up to 6 in. long, the branches bearing sub-umbellate, pedunculate clusters of small flowers; rachis somewhat flattened, rustyscaly; bracts leafy spathulate; bracteoles minute, ovate; pedicels ·1 to ·2 in. long, reflexed. Calyx-lobes ovate, ·06 in. long, ciliate, scaly and glandular-dotted; tube one-third of lobes. Corolla-lobes deep pink, ovate-acute, 14 in. long, with a very few black glands. Stamens nearly as long as corolla-lobes; anthers ovate, acute, '1 in. long, apiculate; filaments rather thick, 3 to 4 in. long, minutely pubescent. Ovary rounded, glabrous; style slender, exsert. Berry globose, often depressed at top, 15 to 2 in. in diam., black when dry.

Perak: Wray 320, 1566; Scortechini. Hilltops at 6,500 to 7,000 feet. 12. Ardisia montana, King & Gamble, n. sp. A shrub reaching 4 to 6 feet in height; branchlets brown, somewhat angular, uppermost covered with a nearly furfuraceous glandular tomentum. coriaceous; elliptic-oblong or oblong-lanceolate, obtusely acuminate at apex, rounded or attenuate at base; scaly above, densely ferruginoushairy and scaly beneath, scales stellate; glandular dots scattered, obscure; margins slightly recurved; 4 to 6 in. long, 1 to 2 in. broad; midrib prominent, impressed above; main-nerves 20 pairs, obscure, irregular, starting nearly at right angles to the midrib and curving upwards to and along the margin; secondary nerves many, reticulations obscure; petiole 5 in. long, channelled above by the decurrent margins of the blade, densely scaly and ferruginous-pubescent. Inflorescence a rather lax, terminal, pyramidal, bi-tri-pinnate, leafy panicle, up to 6 in. long in fruit, shorter in flower, the branches bearing sub-umbellate pedunculate clusters of minute flowers; rachis somewhat flattened, furfuraceous-scaly; branches squarrose; peduncles 5 to 7 in. long; umbel-peduncles 5 in. long; pedicels 2 in. long, often reflexed; bracts leafy, deciduous; bracteoles ovate, very small. Calyx-lobes ovate-acute, under 05 in. long, margins scarious ciliate, dotted with large glands.

Corolla-lobes slightly longer than calyx-lobes, ovate, glabrous, gland-dotted. Stamens as long as corolla-lobes; anthers ovate, apiculate; filaments extremely short. Ovary rounded, glabrous; style subulate, rather thick, scarcely exsert. Berry red, globose, 15 in. in diam., gland-dotted when dry.

Perak: Wray 327, 3869; Scortechini 296; King's Collector 8029. Rocks and hilltops at 3,000 to 7,000 feet.

13. Ardisia sinuata, King & Gamble, n. sp. A shrub or small tree, reaching a height of 10 to 15 feet and a diam. of stem of 2 to 3 in : branchlets pale brown, sinuate, compressed, with raised lines joining the sides of the bases of the petioles, minutely scaly-pubescent or nearly glabrous. Leaves chartaceous; elliptic-oblong, acute or shortly acuminate at apex, rounded or attenuate at base; glabrous above, minutely scaly beneath when young, afterwards glabrate; glandular dots few, scattered; 3 to 6 in. long, 1 to 2 in. broad; midrib slender; main-nerves 10 to 12 pairs, 3 to 4 in. apart, starting from the midrib at an angle of 60° and at once curving upwards to and along the margin; secondary nerves and reticulations faint; petiole 3 to 4 in. long, channelled above by the decurrent margins of the blade. Inflorescence a lax, terminal, bracteate, nearly glabrous, bi-tri-pinnate panicle 5 to 7 in. long, the branches bearing subumbellate clusters of small flowers; rachis flat, sinuate; bracts leafy, uppermost lanceolate recurved, 5 to 1 in. long; bracteoles minute, ovate; pedicels slender, '1 in. long. Calyx-lobes triangularovate, glabrous, ciliate, gland-dotted, 04 in. long. Corolla-lobes pale green or pink, ovate, acute; margins transparent. Stamens nearly as long as corolla-lobes; anthers broadly ovate, shortly apiculate; filaments very short. Ovary rounded, glabrous; style slender, exsert, 1 to 15 in. long. Berry globose, '15 in. in diam., obscurely striate and black when dry.

Perak: Wray 2408, 3023; King's Collector 4599.

14. Ardisia colorata, Roxb. Hort. Beng. 16 (1814), Fl. Ind. I. 581, and Fl. Ind. Ed. Carey and Wall. II. 271. A large shrub or small tree, reaching 25 feet in height and a girth of 1 foot; branchlets compressed, pale brown, more or less lepidote-scaly, furnished with somewhat zigzag raised lines proceeding downwards from the sides of the bases of the petioles. Leaves chartaceous; oblong-lanceolate or elliptic-lanceolate, acute or shortly acuminate at apex, cuneate at base; glabrous on both surfaces, entire; glandular dots many, irregularly scattered, chiefly visible on the upper surface; 5 to 10 in. long, 1.5 to 3 in. broad; midrib prominent beneath, impressed above; main-nerves 20 to 30, also prominently raised beneath and impressed above, usually 3 to 4 in. apart, starting at an angle of 70° to 75° with the midrib, at first straight

then arched upwards to and along the margin; secondary nerves many, slender, 1 to 2 between each pair of main-nerves, reticulations oblique; petiole rather thick, 5 to 8 in. long, channelled above, winged Inflorescence a pyramidal by the decurrent margins of the blade. terminal panicle, 4 to 12 in. long, tripinnate, ferruginous scaly, bearing clustered umbellate racemes of flowers; rachis much flattened, as are its branch peduncles; primary branches 2 to 6 in. long, peduncle 5 in., bracts caducous; secondary branches 5 to 1 in. long, peduncles 2 to ·4 in., bracteoles small, ovate-acuminate; pedicels slender. ·1 to ·2 in. long; umbels many-flowered. Calyx-lobes ovate, bluntly acute, 05 to 08 in. long, densely gland-dotted, margins scarious and ciliate; tube rather shorter than lobes. Corolla-lobes pink, ovate-acute, oblique, unequal, about 15 in. long, not gland-dotted; tube very short. Stamens a little shorter than corolla-lobes; anthers sagittate, acuminate; filaments very short. Ovary ovoid, glabrous; style thick, 2 in. long. Berry globose, 2 to 25 in. in diam., deep red to black, obscurely ribbed when dry, shining. Clarke in Hook. f. Fl. Br. Ind. III. 520; Mez Monog. Myrs. 113. A. pyramidalis, Roth Nov. Pl. Sp. 123 (not of Cav.). Rothii, A. DC. in Trans. Linn. Soc. XVII. 117, Prod. VIII. 126. A. anceps, Wall. in Roxb. Fl. Ind. l.c. 280, and Cat. 2261; DC. Prod. l.c.; Kurz in Journ. As. Soc. Beng. XLVI. II. 224, and For. Fl. II. 107; Scheff. Myrs. 77. A. polycarpa, Wall. Cat. 2285. A. grandiflora, Wall. Cat. 2272.

Kedah: Ridley 5509. Perak: Scortechini 20, 203, 397, 1505, 1568; King's Collector 798, 1301, 3099, 3284, 3567, 6473, 6823, 7741, 8252, 10866; Ridley 5508. Province Wellesley: Ridley 6945. Selangor: Ridley 7559; Goodenough 10551. Malacca: Maingay (K.D.) 1008; Goodenough 1762; Derry 553, 915, 1075; Ridley 1245, 1581, 2817.—Distrib. India, Burma, Malay Islands.

VAR. polyneura, Clarke in Hook f. Fl. Br. Ind. III. 520. Leaves paler when dry than in the typical form; wide, reaching 4-5 in. in width, sometimes reaching 15 in. in length; more usually elliptic, oblong or obovate, more rounded at base; all nerves more prominent. Panicle wide at the base; pedicels much reflexed; rachis very much flattened. A. polyneura, Miq. in Pl. Jungh. I. 198, and Fl. Ind. Bat. II. 1022; Scheff. Myrs. 81.

Perak: Ridley 3000; Scortechini 1290, 1412; Wray 1643, 1950, 2810; King's Collector 527, 2152, 2197, 2629, 3643, 3655, 3657, 4119, 4751, 6922, 8640. Malacca: Griffith (K.D.) 3568.—Distrib. Java.

VAR. complanata, Clarke l.c. Panicles smaller, rusty-pubescent; flowers and berries smaller; panicle, rachis, and branches much flattened. Leaves usually narrower and smaller, rarely over 7 in. long

and 2.75 in. broad. A. complanata, Wall. Cat. 2277; Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 210; DC. Prod. VIII. 126; Scheff. Myrs. 78; Miq. Fl. Ind. Bat. II. 1024. A. sanguinolenta, Bl. Bijdr. 685 (not of Wall.). A. Zollingeri, DC. Prod. VIII. 670.

Penang: Wallich 2277; Curtis 1052, 22494. Perak: Wray 2896, 3929; Scortechini 144, 112; King's Collector 7680.—Distrib. Chitagong, Java, Sumatra.

Var. salicifolia, King & Gamble. Leaves lanceolate, 5 to 7 in. long, 1 to 1.5 in. broad, glabrous, obscurely gland-dotted; main-nerves not prominent. Panicles spreading, leafy; rachis zigzag, much flattened; bracteoles persistent.

Perak: Wray 2960; King's Collector 3216, 6816, 8563. Malacca: Hervey.

VAR. elliptica, King & Gamble. Leaves elliptic or elliptic-obovate, acuminate at apex, cuneate at base, glabrous; 4.5 to 8 in. long, 2 to 3 in. broad; main-nerves fewer, 15 to 20 pairs, less prominent. Panicles rather short and stout, 4 to 6 in. long, pyramidal, rachis less flattened, scarcely zigzag.

Perak: Wray 3293; King's Collector 3326, 3453, 504, 6473, 6624, 6820, 8856.

15. Ardisia crassa, Clarke in Hook. f. Fl. Br. Inc. III. 518 (1882). A small tree; branches pale brown, rounded, stout; branchlets somewhat flattened above and with raised lines from below the base of the petioles. Leaves coriaceous; oblong, acute or slightly blunt-acuminate above, cuneate at base; glabrous and shining above, prescent and with inconspicuous rounded scales beneath; entire; 4 1 j 9 in. long, 1.5 to 2.5 in. broad; midrib prominent beneath; main-nening nearly regular at first, nearly at right angles to midrib, afterwards, pehing upwards and round parallel to the edge, 20 to 27 pairs, secenceary obscure. Inflorescence a terminal rusty-pubescent panicle, te bo 6 in. long, with remote branches ending in closely packed umbs, se rachis thick, much flattened, flexuose; branches first at right angles s; In curved, 5 to 8 in. long; pedicels very short, thick; bracteoles ovate, blunt, about 1 in. long. Calyx-lobes thick, ovate-orbicular, 2 in. long05 minutely ferruginouspubescent, overlapping to right; tube about half nte length of the lobes. Corolla-lobes broadly ovate, unequal, oblique 2 and shortly acute, ·15 in. long. Stamens shorter than corolla-lobes fe inthers ovate, acute; filaments very short, broad at base. Ovary re orded, glabrous; style short, about 1 in. long, subulate. Berry globosely depressed, not striate, ·25 in. in diam. Mez Monog. Myrs. 114.

MALACCA: Maingay (K.D.) 1015; Goodenough 1808.—DISTRIB. Borneo.

A small tree or 16. Ardisia Platyclada, King & Gamble, n. sp. shrub reaching 10 to 15 feet in height; branchlets pale brown, prominently marked by zigzag raised lines joining the sides of the bases of the petioles; uppermost ones prominently flattened and covered with rusty furfuraceous scales, as are also the young leaves. Leaves chartaceous; oblong or elliptic-oblong, abruptly acuminate at apex, attenuate and somewhat rounded at base; both surfaces covered when young with rusty stellate scales, glabrescent when old; margins undulate, recurved; 4 to 6 in. long, 1.5 to 2 in. broad; midrib slender but prominent beneath, impressed above; main-nerves 14 to 18 pairs, 3 to 4 in. apart, rather irregularly parallel, leaving the midrib at an angle of about 65° and joining at 1 to 2 in. from the margin in a very prominent intramarginal looped nerve; secondary nerves and reticulations obscure; petiole none or very short, rarely 2 in. long, rugose, rusty-scaly, and bordered by the decurrent margins of the blade. Inflorescence a terminal, compact, bracteate, rusty-scaly, pyramidal, bi-tri-pinnate panicle, 4 to 5 in. long, the flowers in dense subumbellate clusters on the branches; rachis flattened, flexuose; bracts foliaceous, spathulate or oblonglanceolate, acto 15 in. long; bracteoles small, triangular-subulate; pedicels glabrou, cernuous, about 1 in. long; buds very small, conical. Calyx-lobes pirk, lanceolate, .04 in. long, ciliate, obscurely red-glanddotted; tube as long as or rather shorter than the lobes. Corolla-lobes waxy-white, ovate-acuminate, '07 in. long, slightly gland-dotted; tube very short. Stamens shorter than corolla-lobes; anthers ovate, apiculate; filaments very show. Ovary rounded, minutely pubescent at top; style straight, 15 in. logle, exsert. Berry globose, 15 to 2 in. in diam., glandular-rugose, ey k blue, black when dry.

PERAK: Scortendemi 232; King's Collector 824, 4569, 5863, 8136,

10140; usually in TRIB e mixed forest.

A. pterocaulis, Miq. lan lalonog. Myrs. 111, a tree of the forests of the Sumatran mountains, much resen this at first sight, but the leaves are bigger, the flower panicles much larger a read, the open, with shorter pedicels, and the nerves of the leaves do not meet in a 1mora ant looped intramarginal nerve. (Forbes 1992 in Herb. Calc.)

17. Ardisia poro_{rrs}. Clarke in Hook. f. Fl. Br. Ind. III. 522 (1882). A shrub, reaching 8 300et in height; branches flexuose, almost zigzag, winged by lines deculor int from the bases of the leaf-petioles. Leaves chartaceous; oblong Talcute at apex, cuneate at base or sometimes rounded-acute; glabrous, pale beneath; entire, margin often recurved; glands small and robscure; 5 to 9 in. long, 1.5 to 2.5 in. broad; midrib rather slender, prominent beneath; main-nerves obscure, irregular, about

20 to 25 pairs; secondary faint, all arching upwards into an irregular intramarginal ring and reticulate; petiole 4 in. long, narrowly winged by the decurrent blade. Inflorescence a loose terminal few-flowered paniele up to 6 in. long; rachis flexuous; branches racemose, at right angles to rachis; peduncles 1 to 1.5 in. long, curving upwards; pedicels 5 to 7 in. long, slender, curved upwards; bracteoles minute, ovate, deciduous; flowers 3-5-, usually 4-merous; buds slender. Calyx-lobes ovate, 04 in. long, obscurely dotted; tube short. Corollalobes ovate-lanceolate, pink, 3 in. long by 1 in. broad, recurved in flower, not dotted but striate. Stamens as long as corolla-lobes; anthers very slender, opening by terminal pores as well as longitudinally; filaments very short, thick. Ovary conical, gradually passing into a slender style 25 in. long. Berry globose, 25 in. in diam., ribbed, glossy black when ripe. Koord. & Val. Bijdr. V. 260; Mez Monog. Myrs. 118.

PERAK: Scortechini 116, 1511; King's Collector 3108. MALACCA: Griffith (K.D.) 3578; Maingay (K.D.) 1012; Wray 39; Goodenough 1528; Hervey.

18. Ardisia divergens, Roxb. Hort. Beng. 85 (1814), Fl. Ind. I. 583, and Fl. Ind. ed. Carey & Wall. II. 275. A small tree, reaching 20 feet in height; branchlets slender, smooth, rounded. Laives chartaceous; elliptic or lanceolate, shortly acuminat A. Husseltrounded at base, drying reddish-brown; glabrous 43. A. mucrones; entire, margins slightly incurved; glandular de 83; Koord. & Val, especially near the margin; 3 to 5 in. long, 1 to henaultii, DC. l.c. 15 prominent beneath; primary nerves 8 to 12 pairs, 022; Scheff. Myand joining in an intramarginal prominent nerve with a Bidr. V. Srominent nerve near the edge; secondary nerves few, slender, reticulate; petiole 15 to 3 in. long, winged by the decurrent blade. Inflorescence a loose terminal rusty-pubescent panicle, 2 to 3 in. long, ultimate branches umbelled, 3-5-flowered; main peduncle 5 to 1 in. long, secondary peduncles about 5 in. with lanceolate leafy recurved bracts; pedicels about 4 in. long, thickened above, glandular; bracteoles ovate, deciduous; flowers red, buds short, conical. Calyx-lobes rounded, 05 in. in diam., ciliate, conspicuously dotted with few large, transparent, light brown glands; tube short. Corolla-lobes ovate, acute, 15 to 2 in. long, unequal in size, and oblique; tube very short, dots very few. Stamens a little shorter than the corolla-lobes; anthers large, ovate-acute; filaments very short. Ovary ovoid, glabrous, attenuated into a 1 in. long style. Berry round, smooth, somewhat depressed, tipped by the persistent style. Wall. Cat. 2269; A. DC. Prod. VIII. 130; Clarke in Hook. f. Fl. Br. Ind. III. 521; Mez Monog. Myrs. 117. A. punctata, Jack;

Roxb. Fl. Ind. ed. Carey & Wall. II. 275 (not of Lindl.). A. punctulosa, D. Dietr. Syn. Pl. I. 615; Miq. Fl. Ind. Bat. II. 1025.

Penang: Jack; Wallich 2269; Maingay (K.D.) 1020; Curtis 1769. 19. Ardisia sumatrana, Miq. Pl. Jungh. I. 195 (1853), Fl. Ind. Bat. II. 1018, and Suppl. 247. A large shrub or small tree, reaching 15 to 20 feet in height and 3 to 4 in. in diam. of stem; branches pale brown, smooth; branchlets minutely ferruginous-scaly. Leaves chartaceous; elliptic-oblong or -obovate, rather suddenly acute at apex, acute or cuneate at base; entire, glabrous; glands large, frequent near the margin; 3 to 6 in. long. 1.5 to 2.5 in. broad; midrib slender, prominent beneath, impressed above; main-nerves 12 to 15 pairs, irregularly spaced, starting at an angle of about 50° with the midrib, curving upwards to and along the margin; secondary nerves and innovations indistinct; petiole 3 to 5 in. long, bordered above by the decurrent, often erose, margins of the blade. Inflorescence a compact, shortly pyramidal, 3 to 4 in. long, squarrosely bipinnate panicle; common peduncle none or scarcely 5 in. long; bracts minute, triangular; branch peduncles .7 to 1 in. long, minutely ferruginous-scaly as is the rachis; pedicels 2 to 3 in. long, slender; buds ovoid, conical; flowers waxy-white, pedicels and rachis pink. Calyx-lohes orbicular, 1 in broad, ciliate, with scarious margins, much overlapping; glandular dots very few, scattered. Corolla-lobes shortly connate, or as or ratmenuch twisted, 15 in. long; margins thin, denticulate; glands uminate, 07 in brown. Stamens about two-thirds the length of the conter than corollars ovate-acute, 1 in. long, a few large black glands on Ovary rounded, minoid, glabrous; style subulate, 15 in. long. Berry briggsert. Berry glowards black, globese, shining, 2 in. in diam., smooth, 1e, black-onlate. Scheff. Myrs. 84; Koord. & Val. Bijdr. V. 268; Mez Monog. Myrs. 121.

Perak: King's Collector 771, 5639, 10836.—Distrib. Sumatra, Beccari 325, 724; Forbes 2083 &c.; Java.

20. Ardisia lanceolata, Roxb. Hort. Beng. 85 (1814), Fl. Ind. I. 583, and Fl. Ind. ed. Carey & Wall. II. 275. A large glabrous shrub or small tree, reaching 15 to 25 feet in height; branches cylindric, pale, smooth; branchlets sometimes fugaciously ferruginous-scaly. Leaves coriaceous; elliptic-oblong or -obovate, shortly acuminate at apex, long-cuneate at base; entire or sometimes slightly crenate near the apex; glabrous on both surfaces; glandular dots large scattered, more numerous near the margins; 6 to 11 in. long, 2 to 3.5 in. broad; midrib prominent beneath, impressed above; main-nerves 12 to 15 pairs, oblique, starting at an angle of about 50° with the midrib, and at first more or loss parallel, then arching upwards to join in an irregular intramarginal nerve; secondary nerves similar but shorter, reticulations scarcely prominent,

irregular; petiole 5 to 7 in. long, winged by the decurrent blade, the wings overlapping. Inflorescence a spreading, terminal or sometimes sub-axillary, panicle, 4 to 6 in. long; rachis flexuose, angular or flattened; branches stout, flattened, swollen at base, bearing corymbose racemes of about 7-8 flowers; pedicels 6 to 1 in. long, stout, narrowly clavate, striate, minutely ferruginous-pubescent; bracteoles small, obtuse, deciduous. Calyx-lobes orbicular, 2 in. in diam., enlarged and spreading in fruit, glabrous or slightly pubescent; margins scarious and fimbriate-ciliate, base thickened; glandular dots many, prominent; tube short. Corolla ovate acuminate, pink, much twisted in bud, 35 in. long, of which one-third tube; lobes unequal in size, oblique, dots not prominent. Stamens large, shorter than corolla-lobes; anthers ovate acute, dehiscing longitudinally, back with few large usually oblong prominent black glands. Ovary globose; style 1 to 2 in. long, subulate, twisted. Berry globose, depressed, smooth, 25 to 3 in. in diam., black when dry. Wall. Cat. 2292; A. DC. Prod. VIII. 126; Miq. Fl. Ind. Bat. II. 1025; Clarke in Hook. f. Fl. Br. Ind. III. 519; Mez Monog. Myrs. 122. A. speciosa, Bl. Bijdr. 684; A. DC. l.c. 133; Miq. in Pl. Jungh. I. 197 and Fl. Ind. Bat. II. 1022; Scheff. Myrs. 88; Mez Monog. Myrs. 123. A. purpurea, Reinw.; Bl. Bijdr. 684; A. DC. l.c. 129; Miq. in Pl. Jungh. I. 197 and Fl. Ind. Bat. 1026; Scheff. Myrs. 88; Koord. & Val. Bijdr. V. 265. A. Hasseltii, Blume; Scheff. Myrs. 86; Mez Monog. Myrs. 123. A. mucronata, Bl. Bijdr. 685; A. DC. l.c. 126; Scheff. Myrs. 83; Koord. & Val. Bijdr. V.269; Mez. Monog. Myrs. 123. A. Leschenaultii, DC. l.c. 133; Mig. Pl. Jungh. I. 197 and Fl. Ind. Bat. II. 1022; Scheff. Myrs. 89. A. plagioneura, Scheff. Myrs. 85; Koord. & Val. Bijdr. V. 268.

Penang: Roxburgh; Curtis 2755. Perak: Scortechini 1824; Wray 192, 1401, 2480, 2863, 3659; King's Collector 2954, 3200, 4528, 4785, 6586, 6785, 8730, 10049. Malacca: Griffith (K.D.) 3569, 3579; Derry 512, 1117. Johore: Lake & Kelsall 4033. Singapore: Major McNair; Cantley 133; Ridley 6136, 6436.—Distrib. Java, Sumatra, Borneo, Celebes.

21. Ardisia littoralis, Andr. Repos. X. t. 630 (1811). A glabrous shrub of succulent character, reaching 8 to 10 feet in height; branches thick, rounded; buds lanceolate. Leaves succulent-coriaceous; obovate or oblong-obovate, rounded or bluntly acute or almost lanceolate at apex, cuneate at base; entire; glandular dots many, scattered, inconspicuous; 2 to 5 in. long, 1 to 2.5 in. broad; midrib prominent; mainnerves invisible in the fresh plant, obscure when dry, irregular, 13 to 18 pairs, at an angle of about 60° with the midrib, curved upwards to and along the margin; secondary nerves similar, slender, reticulations

obscure; petiole 3 in. long, thick, winged by the decurrent margins of the blade, which are often erose or wrinkled. Inflorescence of axillary umbellate racemes of about 8 flowers each, racemes shorter than the leaves, about 2 in. long; common peduncle about 1 in. long, usually recurved; pedicels 3 in. long, enlarged in fruit to 5 in. and then clavate thickened; bracteoles oblong, obtuse, deciduous; flowers rosecoloured, buds conica · 4 in. long. Calyx-lobes orbicular, · 1 in. in diam., ciliate, edges somewhat scarious, elsewhere thickly dotted with black glands, tube rather longer than lobes. Corolla-lobes ovate acuminate, oblique, unequal, lineolate and much gland-dotted, 3 in. long; tube short. Stamens nearly as long as corolla-lobes; anthers ovate, acute, united in a cone, opening longitudinally and obscurely septate in the cells; filaments short, on broad bases confluent into a ring adherent to the corolla-lobes. Ovary sub-globose, ending in a subulate style 3 in. long. Berry globose, depressed, 2 in. in diam., smooth, bright red, turning purplish-black when ripe; black glands many, small. Kurz For. Fl. II. 110 and Journ. As. Soc. Beng. XLVI. II. 226. A. obovata, Bl. Bijdr. 688; DC. Prod. VIII. 132. A. humilis, Clarke in Hook. f. Fl. Br. Ind. III. 529 (not of Vahl. and in part only); Mez Monog. Myrs. 127, fig. 20, A-E. A. umbellata, Roxb. Hort. Beng. 16; Fl. Ind. I. 582; Fl. Ind. ed. Carey & Wall. II. 273; Lodd. Bot. Cat. t. 531. A. solanacea, Wall. Cat. 2283A (part), 2283D (not of Roxb.). A. polycephala, Wight Ill. Ind. Bot. t. 145 (not of Wall.). Climacandra obovata, Miq. Pl. Jungh. I. 199, Fl. Ind. Bat. II. 1030; Scheff. Myrs. 05; Koord & Val. Bijdr. V. 271. C. littoralis, Kurz in Journ. As. Soc. Beng. XL. II. 68.

Penang: Curtis 217; Phillips. Perak: Wray 1866, 2373; Scortechini 1053; King's Collector 4960. Malacca: Griffith; Maingay (K.D.) 1010; Hervey. Kelantan: Ridley. Pahang: Ridley 1638. Singapore: Hullett 331, 649; Cantley 153.—Distrib. Malay Islands and eastwards to South China and the Philippines; westwards to Ceylon (C.P. 1803) and Travancore (Wight 1767).

Climacandra multiflora, Miq., and C. salicifolia, Miq., are probably only varieties of this species, which seems to be a coast shrub only.

22. Ardisia Kunstleri, King & Gamble, n. sp. A shrub or small tree, usually 6 to 10 feet high, rising sometimes to 20 feet, and with a stem about 2 to 3 in. in diam.; branchlets thick, dark brown, uppermost and innovations rusty-pubescent; leaf-buds lanceolate. Leaves coriaceochartaceous; elliptic, or elliptic-oblong, shortly acuminate at apex, cuneate at base; minutely pubescent or scaly on both surfaces, afterwards glabrate; entire or obscurely undulate-crenate on the margins

which are somewhat reflexed; glandular dots many, prominent in the areolations of the leaves and along the margins; 8 to 15 in. long, 2.5 to 5 in. broad; midrib slender; main-nerves 20 to 24 pairs, irregularly spaced, starting at an angle of about 65° with the midrib, at first straight then curving upwards to and along the margin where they anastomose; secondary nerves usually one between each pair of mainnerves, reticulations oblique, all raised on the lower surface when dry: petiole 1 to 2.5 in. long, sometimes shorter, thick, channelled above by the decurrent margins of the blade, which are connivent. Inflorescence lateral or axillary, a 5 to 7 in. long corymbiform minutely pubescent raceme of about 18 to 22 flowers, on a thick flattened peduncle 2 to 4 in. long; bracts small, lanceolate, very early caducous; pedicels slender. clavate, 7 to 1 in. long, curved upwards in flower downwards in fruit; buds ovoid, 25 in. long. Calyx-lobes orbicular, 1 in. long, margins scarious ciliate, covered with many black glandular dots; tube shorter than lobes, minutely pubescent without. Corolla-lobes dark blue without, pink within, ovate, acute, 2 in. long, minutely ciliate, prominently dotted, tube 05 in. long. Stamens shorter than corolla-lobes; filaments very short; anthers ovate acuminate, the connective studded on the back with prominent black glands in 2 rows. Ovary ovoid, glabrous; style slender, 15 in. long. Berry globose, blueish-black, 3 in. in diam., faintly striate when dry.

Perak: King's Collector 2207, 2970, 3060, 3264, 4071, 4110, 6486; Ridley 9530.

This species is distinguished by its large elliptic leaves, comparatively small flowers, and large fruits, but comes in some respects near to A. oxyphylla and in others to A. solanacea, and to A. polycephala, Wall.

23. Ardisia solanacea, Roxb. Cor. Pl. 27. t. 27 (1795), Hort. Beng. 16, Fl. Ind. I. 580, and Fl. Ind. ed. Carey & Wall. II. 269. A large shrub, reaching 6 to 8 feet in height; bark ash-coloured, branches stout, glabrous, grey, somewhat angular, buds lanceolate. Leaves coriaceous; oblong or elliptic-oblong, acuminate at apex, cuneate at base, glabrous, entire; glandular dots many scattered in the areolations of the nerves and especially near the margin; 6 to 10 in. long, 2 to 3.5 in. broad; midrib slender, somewhat impressed above; main-nerves 12 to 20 pairs, unequally spaced, leaving the midrib at an angle of about 60°, at first straight but soon curving upwards to and along the margin and then anastomosing; secondary nerves many, rather prominent as are the reticulations; petiole stout, 5 to 8 in. long, channelled above by the decurrent and often connivent margins of the blade. Inflorescence of pedunculate corymbiform racemes, bearing 10 to 16 flowers, from the

axils of the upper leaves or of the scars of fallen leaves, 2 to 4 in. long; peduncle 1 to 2.5 in. long, stout, flattened above as is the very short rachis of the raceme; bracteoles concave, thin, prominently gland-dotted; pedicels '7 to 1 in. long, more or less clavate, slender at first, thicker in fruit; buds conical, 4 in. long. Calyx-lobes orbicular, ciliate, scarious on the margins, 15 to 2 in. long, prominently black-gland-dotted; tube nearly equal to lobes. Corolla-lobes pink, ovate, rounded, 3 to 35 in. long, prominently gland-dotted, minutely ciliate on the margins, otherwise glabrous; tube extremely short. Stamens about two-thirds the length of the corolla-lobes; filaments short, stout, conical; anthers ovate-sagittate, 2 in. long, acute, apiculate, the back of the connective studded with prominent large black glands in a double row. Ovary ovoid, glabrous; style slender, 25 in. long. Berry globose, dark blue or black, ·3 in, in diam. Willd. Sp. Pl. I. 1063; Bot. Mag. t. 1677; Wall. Cat. 2283 A-K; Mez Monog. Myrs. 132, fig. 20 F-K; Cooke Bomb. Fl. II. 86. A. humilis, A. DC. in Trans. Linn. Soc. XVII. 118 (not of Vahl); Wight Ic. t. 1212; Dalz. & Gibs. Bomb. Pl. 137; Clarke in Hook. f. Fl. Br. Ind. III. 529 (in part); Brandis For. Fl. 287; Kurz in Journ. As. Soc. XLVI. II. 226, and For. Fl. II. 100; Prain Beng. Pl. 645. A. elliptica, Bedd. Fl. Sylv. p. CXXXVIII. (not of Thunb.).

Perak: Wray 1900, 3000; King's Collector 6011.—Distrib. India, Burma.

Var. elata, King & Gamble. A small tree reaching 25 to 35 feet in height, and 6 to 8 in. in diam. Leaves thinner, oblong-lanceolate; main-nerves less prominent than in the type. Inflorescence with rather longer stouter peduncles and more numerous flowers. Berry slightly larger.

PERAK: Scortechini 679; King's Collector 4717, 5770.

This variety is scarcely worthy of being classed as such, but, at any rate in the herbarium, the specimens are easily separable.

24. Ardisia lurida, Blume Bijdr. 687 (1826). A large shrub, reaching 20 feet in height and 3 to 4 in. in diam. of stem; branchlets thick, glabrous, as are the lanceolate acuminate leaf-buds. Leaves entire, coriaceous; lanceolate- or sub-obovate-oblong, shortly acuminate at apex, gradually cuneate at base; glabrous and dark green above, pale and ferruginous-brown beneath; glands many, regularly scattered in the areoles of the net venation; 5 to 10 in. long, 1.5 to 2.5 in. broad; midrib prominent; main-nerves 16 to 20 pairs, slender, irregular, starting at about 60° with the midrib, parallel at first and then arched up to and along the margin where they meet; secondary nerves similar, reticulations obscure; petiole 4 to 7 in. long, winged by the decurrent edges of the blade, the

wings connivent above when dry. Inflorescence a short (2 to 3 in. long), axillary, few-flowered, sub-umbellate, minutely ferruginous-pubescent. peduncled raceme; peduncles 1 to 1.5 in. long, flattened; pedicels 4 to ·6 in. in flower, longer in fruit and then clavate; flowers large, waxy, pinkish-white; buds rounded, 4 to 5 in. long. Calyx-lobes ovate-orbicular, emarginate, scarious and ciliate at the edges, puberulous outside. ·2 in. in diam., glandular dots conspicuous, of various sizes, black and brown mixed; tube short. Corolla-lobes ovate, obtuse, oblique, concave and keeled, 4 in. long, 2 in. broad, glandular dots and lineoles prominent, tube very short. Stamens two-thirds as long as petals: anthers hastate, mucronate, opening by longitudinal slits, prominently dotted on the back with large black glands. Ovary rounded, ending in a short subulate style. Berry globose, apiculate, 4 in. in diam. smooth, gland-dotted. A. DC. Prod. VIII, 130; Miq. Fl. Ind. Bat. II. 1019; Scheff. Myrs. 71; Koord. & Val. Bijdr. V. 245; Mez Monog. Myrs. 130.

PERAK: Ridley 7172, 10319.—DISTRIB. Java.

25. Ardisia Oxyphylla, Wall. Cat. 2291 (1829). A shrub; branchlets rounded, smooth; buds narrowly lanceolate, glabrous. Leaves chartaceous; elliptic, acute or shortly acuminate at apex, acutely narrowed at base, entire; glabrous above, glabrous beneath except for a few minute scales; glandular dots many, especially near the margin; 3 to 7 in. long, 1 to 2.5 in. broad; midrib slender, prominent; main-nerves about 16 pairs, irregular, usually at about an angle of 60° with the midrib, more or less parallel at first, then arching nearly to the margin; secondary nerves slender, like the main-nerves, reticulations irregular; petiole 4 to 7 in. long, winged by the decurrent margins of the blade. Inflorescence an axillary, long-peduncled, short, few-flowered (5 to 8) subumbellate raceme, about 2 to 4 in. long; peduncles 1 to 2 in. long, angular when dry; pedicels '4 in. long, '7 in. in fruit, slender; buds rounded, 3 in, long. Calyx-lobes ovate-rotundate, obtuse, 1 in in diam., ciliate on the scarious edges, prominently dotted with numerous black and brown glands; tube short. Corolla-lobes broadly ovate, sub-acute or obtuse, oblique, 25 to 3 in. long, prominently dotted with many black or brown round glands and fewer elongate lineolate ones. Stamens nearly as long as corolla-lobes, almost quite sessile; anthers sagittate, long-acute, the connective prominently marked on the back with large black conspicuous glands. Ovary rounded, ending in a short 15 in. long style, glabrous. Berry globose, 3 in. in diam., fleshy, smooth. A. DC. in Trans. Linn. Soc. XVII. 120, Prod. VIII. 130; Clarke in Hook, f. Fl. Br. Ind. III. 528 variety excepted; Stapf in Trans. Linn. Soc. Ser. 2. IV. 204; Mez Monog. Myrs. 131.

Penang: Wallich 2291; Curtis 668; Ridley 7093. Perak: King's Collector 5624, 5913, 5929, 6185, 8218, 10504. Province Wellesley: Ridley 6953.—Distrib. Andamans or Tenasserim, Helfer (K.D.) 3571, 3585; Borneo.

26. Ardisia Scortechinii, King & Gamble, n. sp. A tree reaching 40 to 50 feet in height and 8 to 12 in. in diam.; branchlets round, dark brown, lenticellate, leaf-buds acuminate. Leaves entire, coriaceous; oboyate, acute at apex, cuneate at base; glabrous, margins incurved; glandular dots many, obscure; 5 to 7 in. long, 1.5 to 2 in. broad; midrib prominent slender: main-nerves 14 to 16 pairs, very oblique, at about 30° to the midrib, curved upwards and joining parallel to the margin; secondary nerves similar but more slender, reticulations curved, surrounding the dots; petiole 4 in., rather broadly edged by the decurrent margins of the blade, which are nearly connivent above; stipules leafy, more or less persistent. Inflorescence 2 in. long, of short axillary peduncled, umbellate racemes 8-12-flowered, in the axils of short leafy bracts; peduncles thick, about 1 in. long, flattened; pedicels 5 in., thickened and longer in fruit; bracteoles ovate, acute, boat-shaped. deflexed, persistent; flowers reddish-pink. Calyx-lobes orbicular, obtuse. ·2 to ·25 in. long, emarginate, ciliate, scarious on the edges, with many parallel veins and many prominent round or oblong mixed black and brown glandular dots; tube short. Corolla-lobes ovate, acute, oblique, ·35 in. long, unequal, with very few dots, some round some lineolate. tube very short. Stamens shorter than corolla-lobes; anthers long acuminate, villous on the connective on both sides, back marked with large black glands; filaments short, very thick. Ovary ovoid, surmounted by the conical, subulate, 2 in. long, glabrous style. Berry globose, smooth, 3 in. in diam., bluish black.

Perak: Scortechini; King's Collector 4662, 4672—on rich soil, in dense jungle, up to 800 feet.

27. Ardisia pendula, Mez Monog. Myrs. 125 (1901). Apparently a shrub; branchlets thick, glabrous below, ferruginous-pubescent at the extremities, leaf-buds lanceolate, ferruginous-pubescent. Leaves chartaceous; elliptic lanceolate, long acute at apex, cuneate at base; entire but sometimes very faintly crenate near the apex; glabrous above, glabrous or slightly ferruginous-pubescent beneath; glandular dots scattered, more numerous and prominent near the margins; 4 to 7 in. long, 1.5 to 2 in. broad; midrib slender; main-nerves 10 to 12 pairs, irregular, starting from the midrib at about an angle of 60°, then arching upwards and joining near the margin; secondary nerves slender, minor nerves reticulate; petiole 3 to 5 in. long, winged by the decurrent edges of the blade. Inflorescence of 3 to 5 in. long axillary peduncled ferruginous-

pubescent racemes; peduncles about 2 in., pedicels ·4 to ·5 in. long, curved. Calyx-lobes ovate, rounded, with many glandular dots, ·1 in. long; tube short. Corolla-lobes ovate-elliptic, rounded, much gland-dotted. Stamens shorter than the petals; anthers acute, dotted on the back; filaments very short. Ovary ovoid, glabrous. Berry globose, black when dry, ·25 in. in diam., much gland-dotted. A. attenuata, Miq. Fl. Ind. Bat. II. 1020 and Suppl. I. 575 (not of Wall.); Scheff. Myrs. 68. A. reclinata, Blume; Scheff. l.c.

MALACCA: Goodenough 1295.—DISTRIB. Java, Sumatra. A poor specimen only available.

28. Ardisia Hullettii, Mez Monog. Myrs. 130 (1901). Apparently a shrub; branchlets light brown, round, smooth; leaf-buds lanceolate, glabrous, black. Leaves membranous; oblong-lanceolate, acuminate at apex, acuminately narrowed at base; entire, glabrous on both surfaces; glands light-brown, large, in the areoles of beautifully netted venation; 4 to 7 in. long, 1.5 to 2 in. broad; midrib slender; impressed above; main-nerves many, slender, irregular, 20 to 24 pairs, parallel at first and then arching upwards and joining in a narrow intramarginal ring; secondary nerves many, like the main-nerves, reticulations numerous; petiole '4 in. long, slender, only very narrowly winged. Inflorescence an axillary, short, few- (1-5) flowered, glabrous, umbellate raceme, peduncle 5 to 7 in. long; pedicels 5 in. long, recurved, more or less clavate; buds conical, 3 to 4 in. long. Calyx-lobes scarcely overlapping, ovate-orbicular, ciliate, 1 to 15 in, long, minutely gland-dotted; tube short. Corolla-lobes ovate-acuminate, upper edges incurved, oblique, unequal, many-nerved, sparsely black-gland-dotted; tube very short. Stamens a little shorter than the corolla-lobes; anthers oblong, mucronate, with 2 lines of prominent black glands on the back; filaments short, spreading at base. Ovary ovoid, thick, glabrous; style short, subulate. Berry brown, smooth, globose, 2 in. in diam., seed whiteringed at base.

MALACCA: on Mount Ophir, Hullett 769, 778.

29. Ardisia oblongifolia, King & Gamble, n. sp. A shrub; branchlets brown, glabrous, with faint decurrent raised lines from either side of the insertion of the leaf-petioles; leaf-buds lanceolate acuminate. Leaves chartaceous; oblong, acute at apex, cuneate at base; glabrous, entire; glandular dots scattered but not prominent except near the margins which are reflexed; 7 to 10 in. long, 2 to 2.5 in. broad; midrib prominent, impressed above; main-nerves 22 to 26 pairs, starting at an angle of nearly 80° from the midrib, at first straight and near the margin curving upwards to and along it; secondary nerves many, usually at least 1 to 2 between each pair of main-nerves, reticulations in an elegant network;

petiole rather slender, ·8 to 1 in. long, bordered above by the decurrent margins of the blade. *Inflorescence* an axillary corymbose raceme of about 8 flowers and about ·5 in. long on a 1·5 to 2 in. long flattened peduncle; pedicels ·75 in. long, clavate. *Calyx-lobes* orbicular, ciliate, gland-dotted, about ·1 in. long; tube as long: rest of flowers unknown. *Berry* globose, ·2 in. long, glandular-dotted.

PERAK: at 1,000 feet, Wray 3797.

30. Ardisia tetrasepala, King & Gamble, n. sp. branchlets slender, pale brown, with indistinct raised lines from the sides of the leaf-petioles, sinuate, slightly scaly above. Leaves chartaceous; elliptic or elliptic-ovate, gradually acuminate at apex, rounded at base; glabrous above, pale brown when dry, very slightly pubescent on and near the midrib beneath; glandular dots many scattered, prominently raised on the upper surface, margins slightly recurved; 4:5 to 6.5 in. long. 1.5 to 2.5 in. broad; midrib prominent below; main-nerves about 16 to 20, irregularly spaced, starting at an angle of 60° from the midrib, curved upwards, dividing and anastomosing with the secondary nerves in a marginal network, all raised beneath; petiole .2 to .3 in. long, channelled above. Inflorescence a pseudo-terminal subumbellate 8-12-flowered scarcely 2 in. long raceme in the axil of the uppermost leaf; peduncle about 5 in. long, pedicels slender, about 5 in. long. Calyx-lobes 4, ovate-orbicular, ciliate, gland-dotted, about 1 in. long. reflexed in fruit: rest of flower unknown. Berry globose, 25 in. in diam., black when dry and prominently dotted with oblong glands.

JOHORE: at Jaffaria and Gunong Palai, 1,500 feet, G. King.

We place this species in Tinus instead of in Tinopsis because not only does the inflorescence seem to be only apparently terminal but its sub-umbellately racemose character seems to approximate more nearly to that of the former section.

31. Ardisia biflora, King & Gamble, n. sp. A small shrub, 4 to 8 feet high; branches smooth, pale brown; branchlets divaricate, slender. Leaves chartaceous; oblong-lanceolate, acuminate at both apex and base; glabrous; entire or very faintly crenulate; glandular dots many, black, large, in the areoles of the reticulations; 3 to 5 in. long, ·75 to 1·5 in. broad; midrib slender; main-nerves 12 to 14 pairs, at an angle of about 55° with the midrib, curving upwards to and along the margin where they meet in a wavy intramarginal nerve; secondary nerves many, reticulations irregular; petiole slender, ·2 to ·5 in. long, sometimes longer. Inflorescence a lateral, 2-flowered, pedunculate umbel, 1·5 in. long; peduncle and pedicels each ·75 in. long, slender. Calyxlobes ovate, scarious and ciliate on the margins, prominently gland-dotted, ·05 in. long; tube as long: rest of flower unknown. Berry

black, globose, 25 in. in diam., ribbed and prominently gland-dotted.

PERAK: in dense jungle on limestone hills at 300 to 800 feet, King's Collector 4296, 4711; Wray 3343. It is very near A. paupera, Mez, of Sumatra, but the long slender peduncle and pedicels distinguish it.

A specimen collected by Scortechini (without number) has similar leaves, but the inflorescence is pseudo-terminal and branched, with more than 2 flowers and very short pedicels.

Ridley's No. 2670 from Pahang seems to be Ardisia rhyncophylla, Clarke, but the specimen is imperfect, and we hesitate to describe it as a Malay plant.

32. Ardisia tahanica, King & Gamble, n. sp. A shrub (?); branchlets brown, shining, somewhat flattened; innovations scaly and hirsute, leaf-buds ferruginous-pubescent, lanceolate. Leaves chartaceous; linearlanceolate, acuminate at both ends; glabrous above, scaly beneath and slightly pubescent along the midrib; margins entire, recurved; glandular dots numerous, scattered, conspicuous on the under surface; 4 to 6 in. long, 7 to 9 in. broad; midrib slender; main-nerves obscure, about 12 pairs, starting at a very oblique angle and curving upwards to and along the margin; secondary nerves similar, reticulations obscure; petiole slender, 4 to 6 in, long. Inflorescence an umbellate peduncled raceme, 1.5 to 2 in. long, from the axils of some of the upper leaves; peduncle slender, .7 to 1.2 in. long; flowers about 5-8, pedicels slender, 5 in. long. Calyx-lobes semi-orbicular, scarious and ciliate on the margins, rusty-pubescent on the back and with many glandular dots, 05 in. long; tube as long as lobes: rest of flower not seen. Berry globose, depressed, 2 in. in diam., prominently striate.

Pahang: Ridley 2669, in Tahan woods.

Goodenough No. 10552, from Selangor, is also possibly the same species, but the leaves reach 1.5 in. in breadth and the peduncle and pedicels are stouter.

33. Ardisia villosa, Roxb. Hort. Beng. 85 (1814), Fl. Ind. I. 582, and Fl. Ind. ed. Carey & Wall. II. 274. A small shrub, reaching 6 to 8 feet in height; branchlets rounded, from nearly glabrous to densely ferruginous-pilose, the hairs moniliform. Leaves chartaceous; oblong-lanceolate or lanceolate, acute or acuminate at apex, cuneate at base; more or less distinctly but shallowly crenate, the crenations broad, margins recurved; glabrous to minutely rusty-hirsute above, densely red-villous beneath, especially on the nerves; glandular dots many, black, prominent; 4 to 8 in. long, '75 to 2.5 in. broad; midrib prominent; main-nerves 8 to 12 pairs, very irregular, slender, obscure, arching upwards and ending in the crenature-glands; secondary nerves similar, meeting the main-nerves, reticulations faint; petiole '4 to '8 in.

long, rusty-villous. Inflorescence a sessile or short-peduncled, more or less rusty-villous, umbellate raceme at the end of the main branchlets or at the ends of long-peduncled axillary 2-leaved branchlets; bracts ovate-lanceolate, 1 to 2 in. long, deciduous; pedicels 3 to 4 in. long, secund; buds conical. Calyx-lobes pink, linear-oblong or lingulate, obtuse or slightly acute, 25 to 3 in. long, 075 in. broad, glabrous to thickly rusty-villous, apex often recurved, glandular lines and dots scattered; tube exceedingly short. Corolla-lobes pale pink, ovate-acute or -acuminate, .25 to .3 in. long, prominently dotted with round or oblong glands, much twisted in bud; tube short. Stamens shorter than the petals, 2 in. long; anthers ovate, acuminate, dehiscing by wide pores in the upper half; filaments very short. Ovary globose, crowned by a slender 2 in. long style, the base of the style and top of ovary minutely pubescent. Berry globose, 25 in. in diam., bright red, sparingly pubescent. A. DC. Prod. VIII. 136; Wall. Cat. 2280A; Miq. Pl. Jungh. 191, Fl. Ind. Bat. II. 1017; Scheff. Myrs. 90; Kurz in Journ. As. Soc. Beng. XLVI. ii. 227 and For. Fl. II. 113; Clarke in Hook. f. Fl. Br. Ind. III. 525 var. excepted; Koord. & Val. Bijdr. V. 253. A. vestita, Wall, in Roxb. Fl. Ind. ed. Carey & Wall. II. 274; A. DC. l.c.; Miq. l.c.; Mez Monog. Myrs. 141. A. mollis, Bl. Bijdr. 689. A. tavoyana, A. DC. in Trans. Linn. Soc. XVII. 125.

Penang: Maingay (K.D.) 1011; Ridley 9357; Curtis 1597. Perak: Scortechini 638; Wray 151, 862, 2967, 3149; King's Collector 1819, 3138, 6104, 6448, 7915, 10052. Pahang: Ridley 2176. Selangor: Ridley 1558; Curtis. Malacca: Griffith (K.D.) 3588; Hervey; Ridley; Curning 2390. Singapore: Ridley, 2833, 2816.—Distrib. Burma, Sumatra, Java, Borneo, and eastwards to Tonkin and Hainan.

Var. glabrata, Kurz l.c. Leaves, at least when full grown, glabrous. Calyx glabrous or nearly so. Stapf in Trans. Linn. Soc. Ser. 2, IV. 204. A. glabrata, Bl. Bijdr. 692; A. DC. Prod. VIII. 136; Miq. Fl. Ind. Bat. II. 1022.

Perak: Ridley 2899; Wray 2801, 3414; King's Collector 949, 4612, 6188, 6255, 7696; Scortechini 315. — Distrib. Java, Sumatra, Borneo.

Ridley's 5510 from Kedah seems to be a form of this with smaller leaves and shorter calyx-lobes, but can hardly be separated as a second variety.

34. Ardisia virens, Kurz For. Fl. II. 575 (1877), and Journ. As. Soc. Beng. XLVI. ii. 226. A small glabrous shrub; branchlets slender, pale, somewhat compressed and twisted. *Leaves* membranous, oblong or oblong-lanceolate, acuminate at apex, cuneate at base; faintly

crisped-crenulate with large glands in the crenulations; pale and glabrous on both surfaces; glandular dots scattered, in the areoles of the reticulations; 4 to 6 in. long, 1.5 to 2 in. broad; midrib prominent, somewhat impressed above; main-nerves about 12 to 14 pairs, irregular and irregularly spaced, usually starting at an angle of about 60° with the midrib, at first straight, branching and joining in an intramarginal nerve close to the margin and passing through the crenature glands; secondary nerves many, slender, reticulations many, curved; petiole .4 to .6 in. long, winged by the decurrent margins of the blade. Inflorescence an almost sessile terminal corymb, composed of long-peduncled sub-umbellate racemes; peduncles 1 to 1.5 in.; pedicels 5 to 8 in. long; buds conical 25 in. long. Calyx-lobes oblong, obtuse, thin, '075 in. long, conspicuously dark-brown-gland-dotted; tube short. Corolla-lobes ovate, bluntly acuminate, oblique, unequal, conspicuously marked by few dark brown lines and dots, 3 in. long; tube very short. Stamens shorter than corolla-lobes, 2 in. long, obtusely hastate; anthers opening by broad longitudinal slits, conspicuously black-gland-dotted on back; filaments short. Ovary rounded, style slender, 2 in. long. Berry globose, pale, somewhat depressed, 3 to ·4 in. in diam., conspicuously marked with round or oblong purple dots, somewhat fleshy. Clarke in Hook. f. Fl. Br. Ind. III. 524; Stapf in Trans. Linn. Soc. Ser. 2, IV. 203; Mez Monog. Myrs. 147.

Perak: Wray 1444 at 2,000 feet.—Distrib. Assam, Cachar, Manipur, Yunnan, Borneo.

35. Ardisia Wrayi, King & Gamble, n. sp. A single-stemmed treelet or shrub reaching 5 feet in height, but usually smaller; upper part of stem 25 in. thick, brown, with spongy bark and scurfy scales; leaf-buds glabrous, lanceolate-acuminate. Leaves membranous; oblonglanceolate, long acuminate at apex, long cuneate at base; margins recurved; somewhat scaly on both surfaces, scurfy along the midrib beneath; glandular dots prominent scattered; broadly crenate, the crenatures shallow with large glands; deep green above, red or purple beneath; 6 to 10 in. long, 1.5 to 3 in. broad; midrib slender; main-nerves 12 to 20 pairs, irregular in angle and distance, curving upwards to and along the margin where they or their branches end in the glands of the crenatures; secondary nerves few, reticulations many scarcely prominent; petiole '7 to 1'3 in. long, somewhat flattened, bordered by the decurrent margins of the blade. Inflorescence of glabrous sub-umbellate racemes from the axils of the uppermost leaves, usually crowded so as to present almost the appearance of a terminal cluster; peduncles usually 5 in. long, occasionally shorter but often longer, even up to 2 in., flattened; racemes very short, much marked by the scars of very

caducous bracteoles; flowers 8 to 12; pedicels slender below, flattened above, twisted and curved, ·3 to ·4 in. long; buds ovoid. Calyx-lobes ovate, acute, ·1 in. long, prominently black-gland-dotted. Corolla-lobes waxy, reddish or purple, ovate, ·15 to ·2 in. long, sparsely gland-dotted. Stamens nearly as long as corolla-lobes; filaments very short, thick; anthers ovate, acute, connective much gland-dotted on back. Ovary rounded; style short, slender, glabrous. Berry globose, red, rugose, ·3 in. in diam., prominently gland-dotted when dry.

PERAK: Wray 438, 2795, 3280, 4051; Scortechini 418; King's Collector 1888, 3631, 6938, 7514, in dense jungle on rich soil, both in low-level localities and up to 4,000 feet in the mountains; one specimen, rather more slender, thinner and more glabrous, from the top of rocks (K.C. 7514).

K.C. No. 6938 from mountains at 3,000 to 4,000 feet, has the main-nerves nearly at right angles to the midrib, while other specimens have it at 60° or even 45°; these are, however, intermediate, and all that can be said is that the character is a variable one. The species seems to resemble the *A. macrocarpa*, Wall., of Northern India, in its habit of growth.

36. Ardisia minor, King & Gamble, n. sp. Apparently a short (12 to 18 in. high) treelet or undershrub; lower part of stem with side rootlets; stem ·2 to ·25 in. thick, rusty-pubescent, dark brown. Leaves coriaceous; elliptic, long caudate-acuminate at apex, attenuate or cuneate at base often unequally; margins recurved, very shallowly crenate, the crenatures with large prominent glands; glabrous on both surfaces but somewhat scaly; 5 to 7 in. long, 2 to 2.5 in. broad; midrib slender; main-nerves about 15 pairs, starting at an angle of about 50° with the midrib, and thence straight to the margin where they or their branches end in the crenature glands; secondary nerves similar to the main-nerves, reticulations oblique, all raised beneath when dry; petiole thick, rugose, rusty-pubescent, 7 to 1 in. long, winged by the decurrent margins of the blade. Inflorescence of very short, rusty-pubescent, umbellate racemes of about 5 to 6 flowers from the axils of the uppermost leaves; peduncle scarcely 2 in. long, thick; racemes about 2 in. long; bracteoles many, ovate or oblong, recurved; pedicels thick. ·3 to ·4 in. long, flattened, recurved. Calyx-lobes ovate acute, ·1 to ·15 in. broad, glabrous, prominently gland-dotted, nearly free. Corollalobes ovate acute, 2 in. long, glabrous, dotted prominently with large black glands. Stamens shorter than corolla-lobes; filaments very short, thick; anthers oblong acuminate, the connective gland-dotted at the back, 1 in. long. Ovary rounded, glabrous; style 1 in. long, subulate. Berry not known.

PERAK: Scortechini.

Very near A. Wrayi, but differs especially in the coriaceous leaves and the shorter and much thicker pedicels.

37. Ardisia perakensis, King & Gamble, n. sp. A small bush: branchlets pale brown, smooth, wrinkled when dry; innovations densely rusty-glandular-pubescent. Leaves membranous; elliptic-lanceolate. long acute both at apex and base; nearly glabrous on both surfaces but with small peltate scales, young leaves rusty-glandular-pubescent; margin slightly recurved, shortly and shallowly crenate or nearly dentate except on the lower third and at the apex, glands in the crenatures present, obscure; glandular dots absent or very sparse; 2.5 to 4 in. long, ·75 to 1·25 in. broad; midrib slender; main-nerves about 16 pairs, rather irregular in angle and distance, meeting near the margin in an irregularly looped intramarginal nerve, reticulations many, transverse, all raised on lower surface; petiole slender, 2 to 4 in, long, bordered by the decurrent margins of the blade. Inflorescence of small, 2-3-flowered, rusty-glandular, pubescent, pedunculate umbels from the axils of upper leaves or of reduced bract-like leaves; peduncles 3 in. long; pedicels ·1 to ·2 in. long; bracteoles ovate, minute; buds ovoid, pale pink. Calyx-lobes triangular-ovate, acute, minutely pubescent and glanddotted, 05 in. long. Corolla-lobes ovate, acute, 1 to 15 in. long, glabrous, sparsely black-gland-dotted. Stamens a little shorter than corolla-lobes; filaments almost none; anthers ovate, acute, 1 in. long. Ovary rounded, glabrous; style subulate, 075 in. long. Berry not known.

PERAK: at 300 feet in Upper Perak, Wray 3462.

38. Ardisia Meziana, King & Gamble, n. sp. A herbaceous undershrub, 1 to 2 feet in height, stem 2 in. in diam.; bark soft, pale brown, upper parts and innovations rusty-glandular pubescent. Leaves chartaceous; elliptic-obovate, shortly and abruptly acuminate at apex, cuneate at base; glabrous above, sparsely glandular-pubescent beneath; margins rather narrowly crenate-dentate except in the lower third to half and at the acumination, recurved, glands in the crenatures obscure; glandular dots many, scattered, inconspicuous; 3.5 to 5.5 in. long, 1.5 to 2 in. broad; midrib slender; main-nerves 10 to 14 pairs, at an angle of about 60° with the midrib, at first straight afterwards curved upwards to anastomose near the margin; secondary nerves few, reticulations oblique, all more or less raised on both surfaces when dry; petiole 3 to 5 in. long, somewhat thickened below, densely rusty-glandular-pubescent. Inflorescence of very short, sessile, rusty-glandular-pubescent racemes of about 6 flowers each, in the axils of the leaves all

down the stem, the racemes 1 to 15 in. long; bracteoles ovate, scarious, conspicuously black-gland-dotted and ciliate; pedicels short, 1 to 15 in. long, stout; buds ovoid; flowers waxy-white. Calyx-lobes 5, ovate, acute, ciliate, hyaline, with conspicuous black dots, 05 in. long; tube as long as lobes. Corolla-lobes, ovate, blunt, 1 in. long, conspicuously black-gland-dotted; tube very short. Stamens nearly as long as corolla-lobes; filaments short, thick; anthers ovate-lanceolate, long apiculate, the connective studded on the back with large black glands. Ovary rounded, style filiform as long as corolla. Berry not seen.

PERAK: on limestone rocks in open jungle at 500 to 800 feet, King's Collector 5838.

We have dedicated this well-marked species to C. Mez, whose Monograph of Myrsines has done so much for the elucidation of the Natural Order, and whose study of *Ardisia* in particular has been of so much help to us.

39. Ardisia Ridleyi, King & Gamble, n. sp. A slender shrub or treelet, reaching 10 to 15 feet in height and about 1 in. in diam.; branchlets dark brown, slender, minutely ferruginous-pubescent; leaf-buds lanceolate, densely ferruginous-pubescent. Leaves membranous; oblong-lanceolate, long acuminate at apex, acuminate or somewhat rounded at base; prominently crenate, the crenatures usually regular, margin slightly recurved; glabrous on both surfaces; glandular dots few, scattered; 4 to 8 in. long, 1.25 to 1.75 in. broad; midrib slender; main-nerves about 12 pairs, at irregular angles and spaces, ending in the crenatures of the margin; secondary nerves and reticulations obscure; petiole ·2 to ·7 in. long, bordered by the decurrent margins of the blade. Inflorescence a 3-6-flowered, sessile, umbellate raceme in the axil of the uppermost leaf of the branchlets; raceme about 2 in. long; pedicels slender, 7 to 1.4 in. long, minutely rusty-pubescent; buds ovoid, acute. Calyx-lobes 5, broadly triangular, acute, 075 in. long, sparsely blackgland-dotted, rusty-pubescent. Corolla-lobes broadly ovate, acute, 15 in. long, glabrous, densely and closely black-gland-dotted. Stamens a little shorter than the corolla-lobes; filaments very short, thick; anthers oblong, hastate, mucronate, 1 in. long. Ovary rounded, glabrous, style slender, 05 in. long. Berry dark red, ovoid, apiculate, sparsely striate and gland-dotted, 25 to 3 in. in. diam.

PERAK: in dense forest at 2,500 to 4,500 feet, Wray 209; King's Collector 5019. SELANGOR: Ridley 8534. SINGAPORE: Ridley 6434.

Very like A. crenata var. angusta but has broader and thinner leaves, differently nerved.

40. Ardisia Crenata, Roxb. Hort. Beng. 85 (1814), Fl. Ind. I. 583,

and Fl. Ind. ed. Carey & Wall. II. 276. An evergreen small glabrous shrub; branchlets thick, somewhat fleshy, striate with faint lines decurrent from the bases of the leaves; leaf-buds small, conical. Leaves chartaceo-coriaceous; lanceolate to oblong-lanceolate, acute or sub-obtuse at apex, acuminately narrowed at base; margins crispately crenate with glands in the crenatures, recurved; glabrous on both surfaces; glandular dots scattered in the areoles of minor nerves, sometimes prominent, often obscure; 2 to 4 in. long, .75 to 1.5 in. broad; midrib slender; main-nerves 10 to 14 pairs, irregular, slender, arching upwards and joining in an intramarginal nerve close to the margin which passes through the crenature glands; secondary nerves similar but fainter, reticulations curved; petiole ·2 in. long, narrowly winged by the crisped edges of the decurrent blade. Inflorescence of short, sessile or shortly peduncled, panicled racemes, springing from the branchlets just below the terminal pair of leaves; pedicels ·2 to ·4 in. long, slender, longer and thicker in fruit, generally recurved; buds conical, 15 to 2 in. long; flowers 4- or 5-merous, waxy pink or white. Calyx-lobes ovate, 05 to 1 in. long, scarious at the edges, dotted with black glands in the middle; tube very short. Corollalobes rose-pink, ovate-oblong, bluntly acuminate, .2 in. long, oblique, unequal, sparsely dotted with round or elongated glands, sometimes papillose at the base within. Stamens shorter than corolla-lobes; anthers ovate-oblong, acute, with few glands on the back; filaments very short. Ovary ovoid, surmounted by a twisted subulate slender style 15 in. long. Berry globose, 25 in. in diam., scarlet, succulent, obscurely striate, crowned by the persistent style. Wall. Cat. 2262; Bot. Mag. t. 1950; Clarke in Hook. f. Fl. Br. Ind. III. 524; Koord. & Val. Bijdr. VI. 190. A. glandulosa, Bl. Bijdr. 690 (not of Roxb.). A. crenulata, Lodd. Bot. Cat. t. 2 (not of Vent.). A. crispa, A. DC. in Trans. Linn. Soc. XVII. 124 and Prod. VIII. 134; Scheff. Myrs. 72; Mig. Fl. Ind. Bat. II. 1020; Kurz in Journ. As. Soc. Beng. XLVI. ii. 226 and For. Fl. II. 113; Mez Monog. Myrs. 144, fig. 22. A. densa and A. polysticta, Miq. Fl. Ind. Bat. Suppl. 575, 576. Bladhia crispa, Thunb. Fl. Jap. 97; Kaempf. Ic. Pl. Jap. t. 7.

Kedah: Ridley 5517. Penang: Wallich 2262; Maingay (K.D.) 1009; Phillips; Curtis 337; Deschamps; G. King; J. Scott. Malacca: Griffith (K.D.) 3583/1; Cuming 2254; Hullett 637; Derry 944. Perak: Scortechini; Wray, 1257; King's Collector 1337, 4180, 4903, 7847 8706, 10566. Selangor: Ridley 10553. Pahang: Ridley 24; Haviland. Johore: Fox 11285.—Distrib. Assam, Burma, Sumatra, Java, Borneo, and eastwards to South China and Japan. Ridley (Trans. Linn. Soc. III. (1893) 317) says the berries are "sweet and eatable."

Var. angusta, Clarke, l.c. Leaves narrowly lanceolate; flowers in a simple umbellate raceme, pedicels divaricate, buds obtuse.

MALACCA: Griffith (K.D.) 3584.

41. Ardisia Rosea, King & Gamble, n. sp. A small shrub reaching 4 to 6 feet in height; branchlets divaricate, purplish-brown when dry, glabrous; buds lanceolate. Leaves membranous; elliptic, cuspidately acuminate at apex, cuneate at base; broadly crenate with shallow crenatures and prominent glands, the margin recurved; glabrous on both surfaces; glandular dots extremely numerous, prominent on the under surface which is paler than the upper when dry; 2 to 4 in. long, 1 to 1.5 in. broad; midrib slender; main-nerves obscure, 8 to 12 pairs, irregular, branching and usually ending in the crenature-glands; secondary nerves and reticulations indistinct; petiole red, slender, ·25 to ·5 in. long, bordered by the decurrent crisped margins of the blade. Inflorescence a corymbiform terminal or pseudo-terminal panicle of umbellate racemes, the branches divaricate, minutely rusty-pubescent; common peduncle, above the last leaf, short, about '05 in.; branch peduncles slender, 5 to 1 in. long; pedicels slender, 2 to 4 in. long, up to 5 in. long in fruit, flattened in flower; flowers in each umbel about 12, usually recurved; buds ovoid, acute. Calyx-lobes 5, triangular-ovate, 05 in. long, glabrous, not glandular; tube as long as lobes, lobes reflexed in fruit. Corolla-lobes waxy-white tinged with pink, or pink only, ovate-acuminate, 2 in. long, much twisted to the left, not glandular. Stamens nearly as long as corolla-lobes; filaments slender, 05 in. long; anthers ovate, blunt, 1 in. long, with very few glands. Ovary rounded, glabrous; style filiform, 15 in. long. Berry black, globose, 25 in. in diam., smooth, tipped with the long slender persistent style.

PERAK: Wray 32, 402; Scortechini 295, 664; Ridley 5511, 9720; King's Collector 3247, 6247, 8057; in dense forests in the mountains from 3,000 feet elevation to the top of Gunong Batu at 6,700 feet.

42. Ardisia longepedunculata, King & Gamble, n. sp. A shrub; branchlets slender, rusty-pubescent, divaricate. Leaves membranous; oblong-lanceolate, long acuminate at apex, attenuate at base; crenulate with shallow glandular crenatures, margin recurved; glabrous on both surfaces, pale beneath when dry; glandular dots many, scattered, prominent on the under surface when dry; 4 to 6 in. long, 1·25 in. broad; midrib slender; main-nerves 12 to 16 pairs, curved upwards to and along the margin usually to end in the crenature-glands; secondary nerves and reticulations obscure; petiole slender, ·5 in. long, bordered by the decurrent crisped margins of the blade. Inflorescence a terminal

pyramidal panicle of long-peduncled racemes, 5 to 6 in. long and 6 to 9 in. broad, branches and rachis all rusty-pubescent; common peduncle about 1 in. long; branch peduncles 2 to 3 in. long, at right angles to the rachis and curved upwards; racemes about 5 in. long, about 8-flowered; pedicels slender, somewhat clavate, twisted, 5 to 1 in. long; bracteoles subulate, caducous; buds ovoid, acuminate. Calyxlobes triangular, blunt, '05 in. long, rusty-pubescent; tube as long. Corolla-lobes pink, ovate, long acuminate, '25 in. long, rusty-pubescent within, not gland-dotted; tube very short. Stamens much shorter than corolla-lobes; anthers oblong, acute; filaments very short. Ovary rounded, style subulate, '25 in. long. Berry purplish-black, globose, '2 in. in diam.

PERAK: at low levels, Wray 296.

43. Ardisia Maingayi, King & Gamble. A "bush or small tree" (Wray), "slender tree" (Scortechini); branchlets smooth, bark brown, pith rather small; innovations glandular-pubescent. Leaves membranous; sub-opposite or falsely whorled; elliptic-obovate or obovatelanceolate, attenuately or abruptly acuminate at apex, attenuately cuneate at base; glabrous on both surfaces except for a few scattered glandular hairs, pale beneath; margin finely toothed except on the lower third, the teeth caudate and glandular; 6 to 11 in. long, 2 to 3.5 in. broad; midrib slender above, thickened below; main-nerves 15 to 20 pairs, irregular in angle and distance, but usually at about 50° with the midrib, straight for about half-way and then curved to and along the margin; secondary nerves and reticulations very faint; petiole none or very short, the base of the leaf almost half stem-clasping. Inflorescence of slender, 6 to 8 in. long, sparsely glandular-pubescent, panicles of long peduncled sub-umbellate racemes, from the axils of upper leaves, of abortive leaves, or of the scars of fallen leaves below them; common peduncle slender, 2 to 3 in. long; branch peduncles very slender, divaricate, 5 to 1.5 in. long, supported by linear subulate 2 to 3 in. long bracts; racemes 3 to 5 in. long, 8-12-flowered; bracteoles small, subulate; pedicels slender, flattened above; buds ovoid acute. Calyx-lobes ovate, obtuse, 05 to 1 in. long, recurved in fruit, minutely pubescent, ciliate on the margins. Corolla-lobes white, ovate, acute or acuminate, 15 in. long, glabrous, gland-dotted. Stamens much shorter than corolla-lobes; filaments short, dilated at base; anthers oblong, bluntly mucronate, 1 in. long. Ovary rounded, glabrous; style slender, 05 in. long. Berry red, ·3 in. in diam., longitudinally ribbed when dry. A. odontophylla, Wall., var. Maingayi, Clarke in Hook. f. Fl. Br. Ind. III. 526. Perak: Wray 304, 953, 1597; Scortechini 335, 339; Curtis.

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MALACCA: Maingay (K.D.) 1016, in the mountains about 4,500 feet and below.

Although Wray and Scortechini describe this more or less as a "tree," Maingay's specimen is that of a semi-herbaceous undershrub about 24 in. high, sending out roots from above the ground-level.

44. Ardisia theæfolia, King & Gamble, n. sp. A small shrub reaching 3 feet in height; branchlets brown, smooth, the uppermost parts and innovations rusty-glandular-pubescent. Leaves chartaceous; elliptic, long acuminate at apex, acuminate at base; alternate or subopposite or falsely whorled; minutely glandular-pubescent on both surfaces, scaly beneath; margins recurved, finely toothed except on the lower third and on the acumination, the teeth erect, glandular; glandular dots very numerous and prominent on both surfaces; 2 to 3 in. long, ·7 to 1·2 in. broad; midrib slender; main-nerves 10 to 14 pairs, close, curved upwards to near the margin, reticulations obscure; petiole ·4 in. long, bordered by the decurrent margins of the blade. Inflorescence a 1.5 to 2.5 in. long panicle with short racemose branches in the axil of a leaf or of a subulate 2 in. long linear abortive leaf between the leaves on the upper part of the branches; branches 5 in. long, slender, divaricate; bracteoles minute, linear; flowers 2 to 5 in each raceme, buds ovoid. Calyx-lobes 5, rounded, 05 in. long, ciliate. Corolla-lobes 5, white, ovate, acute or obtuse, 15 in. long, gland-dotted. Stamens as long as corolla-lobes; filaments very short; anthers broadly oblong, mucronate. Ovary rounded, gradually produced in an erect or curved style, 1 in. long. Berry pyriform or nearly globose, 2 in. in diam., smooth, slightly ribbed when dry.

PERAK: on Ulu Batang Padang at 4,900 feet, Wray 1513; Scortechini.

45. Ardisia odontophylla, Wall. Cat. 2279 (1829) (not of Lindl.); A. DC. Trans. Linn. Soc. XVII. 125, t. VI., Prod. VIII. 135; Clarke in Hook. f. Fl. Br. Ind. III. 525; Mez Monog. Myrs. 150. A. pavonina, Herb. Hamilt. fide DC. in Prod. l.c.—Distrib. India (Assam and Cachar).

Var. Lobbii, Clarke in Hook. f. Fl. Br. Ind. III. 526. An almost herbaceous undershrub reaching to about 2 feet in height, the stems rooting from nodes near the base; bark fleshy, pale brown; pith large; upper part of stem densely fulvous-villous; leaf-buds small, short. Leaves membranous, sub-opposite; elliptic or elliptic-oblong or obovate-lanceolate, acute at apex, cuneate at base and sometimes slightly rounded; the margins sharply serrate except for a short distance near the base; glabrous above except on the hirsute midrib, rusty-tomentose beneath, the midrib and main-nerves usually ferruginous-

villous on the lower surface; glands scattered, not prominent; 4 to 8 in. long, 1.5 to 3.5 in. broad; midrib thick, prominent; main-nerves 8 to 12 pairs, prominent, irregular in distance and angle, curving upwards to and along the margin; secondary nerves few, reticulations transverse; petiole variable, stout, 4 to 1 in. long, ferruginous-villous. rarely glabrescent. Inflorescence of short (under 1 in. long) lax. fewflowered, pubescent, simple or compound, umbellate racemes, from the axils of leaves below the summit or of a linear subulate abortive leaf about 5 in. long; peduncles slender, 5 to 2 in. long; pedicels slender. ·3 to ·7 in. long, recurved: bracteoles short, subulate: buds ovoid. Calux-lobes ovate, obtuse, ciliate, 1 in. long, slightly pubescent, marked with faint brown striæ; tube short. Corolla-lobes pink, ovate, obtuse or bluntly acuminate, 15 to 2 in. long, unequal, marked with many light brown linear and round glands; tube short. Stamens half the length of the petals; anthers broad, oblong, '1 in. thick, emarginate; filaments very stout. Ovary ovoid, gradually narrowed into a slender subulate style 1 in. long, the top of the ovary and base of the style short pubescent. Berry globose, scarlet, fleshy, 25 in. in diam.. smooth.

PERAK: Wray 2285, 2975; King's Collector 2583, 2978, 3053, 7367. SELANGOR: Ridley 7560. PAHANG: Ridley 2270, 5825. SINGAPORE: Lobb 316, an undershrub of dense forests in wet localities.

Ridley's Pahang specimens have smaller leaves and longer calyx-lobes, with fewer-flowered inflorescences, the whole plant more thickly fulvous-villous, but do not seem capable of separation.

46. Ardisia bambusetorum, King & Gamble, n. sp. A small semiherbaceous shrub 1 to 2 feet high; stem pale brown about 25 in. in diam., bark spongy, pith large. Leaves membranous; oblong or oblonglanceolate or oboyate-oblong, acute at apex, narrowly attenuate at base and slightly rounded; glabrous on both surfaces, slightly scaly only beneath; glands few, scattered, chiefly near the margin; margins very briefly and irregularly toothed, usually recurved; 4 to 6 in. long, 1 to 1.5 in. broad; midrib slender; main-nerves 8 to 10 pairs, starting at an angle of about 50° with the midrib, curved upwards, and often branching, to and along the margin, where they anastomose in a rough. intramarginal nerve; secondary nerves few, reticulations oblique; petiole ·4 to ·6 in. long, channelled above. Inflorescence of lateral pedunculate racemes 1 to 1.5 in. long supported by a linear abortive leaf 5 in. long; peduncle 7 to 8 in. long, raceme the same; bracteoles small subulate about 1 in. long; pedicels slender, clavate, .4 to .5 in. long recurved; buds ovoid; flowers white.

Calyx-lobes 5, linear-oblong, acute, reflexed, ·05 to ·07 in. long, not gland-dotted. Corolla-lobes ovate-oblong, ·15 in. long, dotted with elongated brown glands. Stamens shorter than the corolla-lobes; filaments short; anthers oblong, obtuse, emarginate, ·1 in. long. Ovary rounded, glabrous; style slender, curved, ·1 in. long. Fruit not seen.

Perak: in dense bamboo forest, King's Collector 10095.

This is scarcely more than a var. of A. odontophylla, but is recognised by the somewhat different leaves, white flowers, glabrous ovary and style, and the absence of fulvous tomentum.

6. Antistrophe, A. DC.

Slender shrubs, with puberulous branchlets. Leaves alternate, entire or dentate, lanceolate, acuminate, glandular, petiole margined. Flowers hermaphrodite, in sub-sessile axillary umbels or solitary, pedicels slender, bracts small. Calyx small, 5-lobed, persistent; lobes acute, imbricate. Corolla deeply 5-cleft; lobes lanceolate acuminate, overlapping to the left in bud. Stamens 5, inserted on the throat of the corolla; filaments short; anthers free, hastate-lanceolate, the connective produced upwards in a membranous tip, cells dehiscing longitudinally and introrsely. Ovary ovoid, attenuated in a filiform style, stigma punctiform; ovules many on a globose central placenta. Fruit a globose berry, pericarp coriaceous, endocarp chartaceous. Seed 1, albumen ruminated; embryo cylindric, transverse.—Distrib. Species 4, Indian and Malayan.

Inflorescence 1-2-flowered, glabrous; leaves caudate acuminate ... 1. A. caudata.

Inflorescence 4-6-flowered, hirsute; leaves short acuminate ... 2. A. Curtisii.

1. Antistrophe caudata, King & Gamble, n. sp. A shrub or small tree; branches smooth, divaricate, nearly glabrous; branchlets puberulous, with faint raised lines from the bases of the leaf-petioles; innovations rusty-pubescent. Leaves membranous; elliptic-lanceolate, caudate-acuminate at apex, attenuate or somewhat rounded at base; entire or undulate on the margins; glabrous on the upper, minutely puberulous or glabrous and with pale peltate scales on the lower, surface; glandular dots very many, scattered, prominent; 3 to 4 in. long, 1 to 2 in. broad; midrib slender, conspicuous below; main-nerves 8 to 12 pairs, prominent beneath, at an angle of about 60° with the midrib, arching upwards, forking and obscurely anastomosing near the margin, the lowest pair of nerves more oblique than the rest; secondary nerves short, slender, reticulations indistinct; petiole 1 to 2 in. long, edged by the decurrent margins of the blade which are almost connivent above. Inflorescence of short, axillary, usually only 1-2-flowered sub-

sessile umbels, with very minute bracts; pedicels slender, clavate, 4 in. long; buds conical, long acuminate, 3 in. long, glabrous. Calyxlobes ovate, acute, 05 in. long, ciliate on the edges, gland-dotted in two central lines. Corolla-lobes ovate, long-caudate-acuminate, 3 in. long, glabrous, dotted with few elongate glands. Stamens inserted at the base of the corolla-lobes and nearly as long as them (25 in.); anthers sagittate-lanceolate with prominent rows of glands on the back, connective produced upwards in a membranous tip. Ovary ovoid, glabrous; style subulate, 25 in. long, very slender. Berry globose, 25 in. in diam., smooth, obscurely vertically striate.

PERAK: at Gunong Batu Pateh, 3,400 feet, Wray 456, 978, 3242; Curtis 3324.

This species at first sight resembles A. oxyantha, A. DC., of North-East India, but has smaller and differently-veined leaves, with different glands and smaller flowers.

2. Antistrophe Curtisii, King & Gamble, n. sp. A shrub (?); branchlets round, rusty-glandular-hirsute, zigzag, with faint raised lines from the bases of the petioles of the leaves; innovations densely rustyglandular-hirsute. Leaves membranous; elliptic or elliptic-oblong, acuminate at apex, rounded at base, entire; nearly glabrous above except on the midrib, sparsely rusty-hirsute beneath; 3.5 to 5 in. long, 1.5 to 2 in. broad; midrib slender, raised beneath; main-nerves about 10 pairs, at about an angle of 50° with the midrib, curved upwards, forked and broadly anastomosing near the margin, lowest pair not more oblique than the others; secondary nerves and reticulations obscure; petiole · 2 in. long, crispedly channelled above. Inflorescence of densely rusty-hirsute, sub-sessile, axillary, 4-6-flowered, umbellate racemes, 1 to 15 in. long; bracteoles subulate, 05 in. long; pedicels slender, 3 to 5 in. long; buds caudate-acuminate, 3 in. long. Calyxlobes linear subulate, 1 in. long, densely rusty-hirsute. Corolla-lobes ovate at base, long caudate-acuminate, 3 in. long, scarcely dotted, 3-5-nerved, sparsely hirsute without. Stamens rather shorter than the corolla-lobes, connivent in a cone; anthers sessile, lanceolate sagittate, the back with 2 rows of prominent round or elongate glands, the connective produced in a blunt membranous tip. Ovary ovoid, style slender, as long as anthers. Berry not seen.

PERAK: in Kuran Valley, below the gap, 4,000 feet, Curtis 3390.

7. Ægiceras, Gaertn.

Sea-coast shrubs, or small trees; branches cylindric, glabrous. Leaves scattered, petioled, entire, glabrous, alternate. Flowers large

(for the Order) white, pedicellate, without bracteoles, in terminal or axillary umbels or panicles, pedicels slender. Calyx 5-lobed; lobes obtuse, coriaceous, twisted to the left, overlapping to the right; tube none. Corolla with short tube; lobes 5, acute, overlapping to the right in bud, afterwards recurved. Stamens 5, inserted on the corolla-tube; filaments elongate, connate into a tube below; anthers with transversely septate cells, cordate-lanceolate, introrse, dehiscing longitudinally. Ovary fusiform, narrowed into an elongated style; stigma acute; ovules many, immersed in a central globose placenta. Fruit cylindric, curved, acute, coriaceous, 1-seeded; pericarp coriaceous, afterwards splitting, testa membranous. Seed elongate, exalbuminous; radicle inferior, enlarged at the base, joined with the cotyledons into a cylindric tube; germination often taking place while still on the plant, as in some Rhizophorea.—Distrib. Two species, of the sea-coasts of India, Burma, the Malay Peninsula and Islands, to South China and

tropical Australia.

ÆGICERAS MAJUS, Gaertn. Fruct. I. 216, t. 46, fig. 1 (1788). A shrub or small tree reaching 15 to 20 feet in height, evergreen, all parts glabrous; branches greyish-black, smooth; branchlets reddish. Leaves coriaceous; obovate, rounded obtuse or emarginate at apex sometimes even obcordate, cuneate at base, margins recurved; glandular dots many, inconspicuous; 1.5 to 3.5 in. long, 1 to 1.5 in. broad; midrib slender, raised above or sometimes depressed; mainnerves about 10 pairs, slender, raised above, straight at first then curving upwards; secondary nerves slender, few, reticulations not prominent; petiole 2 to 3 in. long, thick, bordered by the decurrent margins of the blade. Inflorescence a terminal, axillary or leaf-opposed many- (15 to 20) flowered umbel, sessile or very short peduncled; bracts oblong-lanceolate, deciduous; pedicels slender, 3 to 5 in. long; buds conical. Calyx-lobes concave, gibbous at the base, broadest at top, 25 in. long, 15 in. broad, with parallel veins and scattered black dots in the lower part. Corolla-lobes ovate, acuminate, glabrous, parallel-veined, 25 in. long, recurved; tube as long as lobes, villous hairy within. Stamens longer than corolla-lobes, exsert; filaments connate half-way up, linear, connate part densely villous, free part glabrous ·2 in. long; anthers ·1 to ·15 in. long, dorsifixed, cells prominently septate. Ovary ovoid, surmounted by a subulate angular style, 3 in. long, black-gland-dotted below. Fruit a long acuminate pale brown capsule, up to 3 in. long, 25 in. in diam., glabrous. Seed 1, elongate, filling the capsule, embryo inverse, funicle very long. Willd. Sp. Pl. I. 1185; Roem. & Schult. Syst. Veg. IV. 511; Roxb. Fl. Ind. III. 130; A.DC. in Ann. Sc. Nat. 2, XVI. t. 9A, and Prod. VIII.

142; Wight Icon. t. 146; Miq. Fl. Ind. Bat. II. 1031; Scheff. Myrs. 97; Benth. Fl. Austral. IV. 277; Dalz. & Gibs. Bomb. Fl. 137; Bedd. Fl. Sylv. CXXXIX. Anal. pl. XIX. III.; Clarke in Hook. f. Fl. Br. Ind. III. 533; Trimen Fl. Ceyl. III. 74; Cooke Fl. Bomb. II. 88; Koord. & Val. Bijdr. V. 276; Pax in Engl. & Prantl Pflanzenfam. IV. i. 97, fig. 57; Schimp. Strandfl. 44, figs. 1, 2; Prain Beng. Pl. 645. Æ. fragrans, Koenig Ann. of Bot. I. 129, t. 3; Wall. Cat. 2326; Wight in Hook. Bot. Misc. III. 84, t. 21. Æ. minus, A. DC. l.c. 142. Æ. Malaspinæa, DC. l.c. 143. Æ. obovatum, Blume Bijdr. 693. Æ. corniculatum, Blanco Fl. Filip. 79; Kurz in Journ. As. Soc. Beng. XLVI. II. 227 and For. Fl. III. 114; Mez Monog. Myrs. 55, fig. 8. Rhizophora corniculata, Linn. Sp. Pl. Ed. 3 (1764), 635. "Pou-Kandel," Rheede Hort. Mal. VI. 36. Mangium fruticosum corniculatum, Rumph. Herb. Amb. III. 117.

PENANG: Wallich 2326; Curtis 52, 513. PERAK: King's Collector 4961. Malacca: Maingay (K.D.) 1017; Griffith (K.D.) 3538. SINGAPORE: Ridley 2801A, 3632A.—DISTRIB. Sea-coast of India from Sind to Ceylon, the Sundarbans, Burma, and the Andaman Islands; eastwards to the Malay Islands, South China, the Philippines and Australia. One of the coast plants included under the general name of "Mangroves."

Order LXXI. SAPOTACEÆ.

Trees or shrubs, with milky juice, generally evergreen, young parts often rusty-tomentose. Leaves alternate, rarely sub-opposite, coriaceous or rarely membranous, entire, penniveined; stipules none or very caducous. Flowers usually hermaphrodite, small or medium-sized, solitary or fascicled in the axils of the leaves, sometimes (Sarcosperma) paniculate; bracts and bracteoles very small or wanting. Calyx inferior, persistent or deciduous; lobes 4 to 8, much imbricate, occasionally biseriate with the outer ones valvate. Corolla gamopetalous; tube short, campanulate or urceolate; lobes as many as, or 2 to 4 times as many as, those of the calyx. Stamens inserted on the corolla-tube in 1 to 2 series and opposite to them, sometimes alternating with staminodes; filaments short, erect; anthers ovatelanceolate or linear-sagittate, 2-celled, the connective sometimes produced. Disk hypogynous, often inconspicuous or wanting. Ovary superior, sessile, often villous, 2-5- or more celled; style shortly conical or elongate-subulate, glabrous; stigma terminal, punctiform; ovules solitary in the cells, attached to the inner angle. Fruit an indehiscent, 1-8-seeded berry, pericarp usually fleshy. Seeds, if solitary, conform to

the fruit; if more than one compressed, ellipsoid; hilum conspicuous; testa usually crustaceous, shining; embryo straight, exalbuminous with fleshy cotyledons, or albuminous with flat cotyledons; radicle inferior, usually small.—DISTRIB. About 320 species, in the tropical regions of the whole world, genera about 24.

Calyx-lobes 1-seriate, imbricate; stamens 5 to 6:—	
	1. Chrysophyllum
Staminodes present:—	
Flowers sessile or in panicles	2. SARCOSPERMA.
Flowers in axillary fascicles	3. Sideroxylon.
Calyx-lobes 2-seriate, outer series valvate:—	
Calyx segments 4:—	
Seeds albuminous:—	
Stamens 8	4. Isonandra.
Stamens 12 or more	5. PAYENA.
Seeds exalbuminous, stamens 12 or more	6. Bassia.
Calyx segments 6 to 8:—	
Staminodes none, seeds exalbuminous	7. PALAQUIUM.
Staminodes present, seeds albuminous	8. Mimusops.

1. CHRYSOPHYLLUM, Linn.

Trees with milky juice. Leaves coriaceous, glabrous or pubescent on the under-surface, main-nerves usually very many, thin; stipules none. Flowers small, in axillary fascicles, usually hermaphrodite. Calyx 5-7-lobed; lobes subequal, imbricate. Corolla tubular-campanulate or sub-rotate, 5-7-lobed; lobes imbricate, entire. Stamens equal in number with, and opposite to, the corolla-lobes, attached to the tube or the base of the lobes; filaments subulate or filiform; anthers ovate or triangular, extrorse or laterally dehiscing; staminodes none. Ovary villous, 5-, rarely 6-7-celled, style glabrous; ovules one in each cell, attached to the central placenta. Fruit a fleshy or coriaceous berry, globose, 5-celled or less by abortion. Seeds large; testa very hard, dull or shining; hilum conspicuous; embryo as large as the seed, erect, cotyledons flat in fleshy albumen, radicle inferior.— DISTRIB. About 60 species, chiefly tropical American, a few only in Asia, Africa and Australia.

Chrysophyllum Roxburghii, G. Don Gen. Syst. IV. 33 (1837). A slender, erect tree reaching 40 to 60 ft. in height, evergreen; branches horizontal; bark smooth, grey; young branchlets and innovations ferruginous-pubescent. Leaves coriaceous, glabrous, alternate; oblong-lanceolate, suddenly caudate-acuminate at the apex which is sometimes obtuse, cuneate at base and unequal, undulate on the margins; 3 to 6 in. long, 1.25–2 in. broad; midrib slender, prominent

beneath; main-nerves very numerous, parallel, nearly at right angles to midrib, meeting in an intramarginal nerve; secondary nerves similar, reticulations slanting; petiole thick, 25 in. long, pubescent. Flowers small, in rounded axillary fascicles; pedicels slender, 1 to ·2 in. long, ferruginous-pubescent. Calyx-lobes 5, ovate, glabrous or pubescent outside, thick, ciliate on the margins, 07 to 1 in. long; tube short. Corolla tubular-campanulate, 1 in. long; lobes 5. short, ciliate on the margins. Stamens 5, shorter than the corolla. opposite the corolla-lobes and inserted on the base of the tube; filaments slender; anthers ovate, apiculate and ending in a minute tuft of hairs, extrorse, slits somewhat lateral. Ovary rounded, obscurely 5-lobed, surrounded by a thick tuft of long ferruginous hairs; style thick, cylindro-conical, glabrous; cells 5. Fruit a globose or obscurely 5-lobed berry 1 to 1.5 in. in diam., strongly 5-lobed when dry, ferruginous-tomentose when young afterwards smooth, yellowishgreen, with thick glutinous pulp. Seeds 6 in. long, 5 in. broad, flattened, the outer edge curved, the inner nearly straight; hilum oblong, conspicuous, pale; testa very hard, thick, shining, chestnutbrown; embryo erect, cotyledons flat, 4 in. broad, ovate, obtuse, 3-nerved; radicle large, cylindric. A. DC. Prod. VIII. 162; Clarke in Hook. f. Fl. Br. Ind. III. 535; Bedd. Fl. Sylv. t. 236; Kurz For. Fl. II. 118 and in Journ. As. Soc. Beng. XLVI. ii. (1877) 228; Trimen Fl. Ceyl. III. 76; Dalz. & Gibs. Bomb. Fl. 138; Cooke Bomb. Fl. II. 88; Burck Ann. Gard. Buit. V. i. (1886), 4; Koord. & Val. Bijdr. I. 130. C. acuminatum, Roxb. Fl. Ind. I. 599; Wall. Cat. 4160 (not of Lamk.). C. lanceolatum, A. DC. l.c.; Mig. Fl. Ind. Bat. II. 1035. C. javanicum, Steud. Nom. Ed. II. i. 359. Nycteristition lanceolatum, Bl. Bijdr. 676.

Malacca: Griffith (K.D.) 3600; Maingay (K.D.) 980; Goodenough 1739. Singapore: Ridley 2756, 5837.—Distrib. British India; Burma; Java; Sumatra.

Curtis No. 1072, collected at Batu Ferengy, Penang, and now in the Kew Herbarium, seems to be a new species of Chrysophyllum. The leaves are chartaceous, lanceolate, acuminate at both ends, glabrous, shining, 2 to 4 in. long, '75 to 1 in. broad, the veins indistinct. Flowers unknown. Fruit a fleshy berry, '5 in. in diam., 5-lobed when dry, glabrous. Seeds '4 in. long, '25 in. broad, rounded on the outside, narrowed and somewhat concave within; testa hard, dark chestnut-brown, shining; hilum narrow. It might be called C. Curtisii, n. sp., King & Gamble.

2. SARCOSPERMA, Hook. f.

Glabrous trees. Leaves coriaceous or chartaceous, opposite and alternate, oblong; stipules caducous. Flowers small, sessile or fascicled

on the branches of a simple or compound panicle, sessile or shortly pedicellate; bracteoles minute. Calyx-lobes 5, rounded, sub-equal, much imbricate. Corolla broadly campanulate; tube short; lobes 5, rounded, entire, much imbricate. Stamens 5, inserted on the tube of the corolla and opposite to its lobes; filaments very short; anthers obtuse, laterally or extrorsely dehiscing. Staminodes 5, small, subulate or rounded. Ovary glabrous, 1-2-celled; style short; stigma somewhat lobed, capitate. Fruit an ellipsoid berry, 1-2-seeded; pericarp coriaceous, scarcely thick. Seeds 1-2; testa crustaceous; hilum nearly basal; albumen none; embryo fleshy.—Distrib. Species 3, in North-East India, Burma, Malaya and S. China.

SARCOSPERMA PANICULATUM, Stapf & King in Hook. f. Ic. Plant. t. 2690 (1901). A tree, reaching 50 to 70 feet in height and 18 to 20 in. in diam.; branchlets thick, dark brown, glabrous. Leaves chartaceous; sub-opposite, elliptic-oblong, bluntly acuminate at apex, acute or rounded or often rhomboid at base; glabrous on both surfaces, nearly black when dry; 4 to 8.5 in. long, 1.5 to 3 in. broad; midrib slender; mainnerves 7-8 pairs, slender, distant, often nearly 1 in. apart, starting at an angle of about 60° with the midrib and at once curving upwards to and along the margin; secondary nerves many and, like the transverse reticulations, inconspicuous; glandular pits in the axils of most of the main-nerves; petiole 5 to 7 in, long, channelled above and with two minute rounded auricles below the blade. Flowers solitary or clustered on the branches of a leafy compound panicle of racemes, the racemes often 2 in. long; bracteoles minute, triangular; pedicels rarely reaching ·05 in. in length, stout; buds globose. Calyx-lobes 5, imbricate, rounded, usually 3 larger with somewhat scarious margins, 2 smaller thicker and slightly acute, shortly campanulate. Corolla-lobes 5, closely imbricate, rounded, glabrous, 05 in. long, the margins revolute; tube as long as lobes. Stamens 5, inserted on the top of the tube; filaments very short; anthers ovate, rounded, introrse, or laterally dehiscing. Staminodes alternating with the stamens, minute, nearly orbicular, crenulate. Ovary conical, furrowed; style very short, thick, stigma capitate, minutely 2-4-lobed. Fruit drupaceous, ellipsoid, seeds, 1-2. Bracea paniculata, King in Journ. As. Soc. Beng. LXIV. ii. 101.

Perak: Scortechini; King's Collector 7970, 8086, 10284, 10554, 10672, 10835; among large bamboos, on river-banks, or in mixed forest.

3. SIDEROXYLON, Linn.

Trees or shrubs, sometimes armed, with milky juice. Leaves coriaceous or thinner, entire, alternate; stipules none. Flowers

small, in fascicles in the axils of the leaves or of the scars of fallen leaves, sub-sessile or shortly pedicelled. Calyx of 5-6 imbricate, usually orbicular and obtuse segments. Corolla campanulate, or tubular-campanulate, with 5 or rarely 6 lobes, the lobes imbricate. Stamens as many as the corolla-lobes and opposite to them, attached to the tube or at its base; filaments linear, usually short; anthers ovate or lanceolate; staminodes alternating with the stamens, lanceolate. Ovary usually villous, with 5 or fewer cells; style cylindric; stigma small; ovules erect, placentas axile. Fruit an ovoid or globose fleshy berry, 5- or less-seeded, usually with one seed only. Seeds compressed, generally solitary; testa hard, crustaceous, usually shining; hilum oblong or linear; embryo erect, cotyledons flat or thickened, in fleshy albumen; radicle short, inferior.—Distrib. About 60 species, mostly of tropical regions in both hemispheres, a few only extratropical in South Africa or Australasia.

Leaves more than 3 in. broad, yellowish when dry, main-nerves very prominent .. 1. S. malaccense. •• Leaves under 3 in. broad, green or brown when dry :-Leaves nearly glabrous, membranous, obovate-acuminate .. 2. S. Maingayi. Leaves pubescent beneath, at least on the nerves:-Corolla-tube longer than the lobes; leaves elliptic, grey-silky beneath .. 3. S. Derryanum. Corolla-tube shorter than the lobes:-Leaves obovate, main-nerves not very prominent or regular 4. S. ferrugineum. Leaves oblong-lanceolate, main-nerves very prominent and regular 5. S. firmum.

Species imperfectly known: 6. S. Wallichianum.

1. Sideroxylon malaccense, Clarke in Hook. f. Fl. Br. Ind. III. 537 (1882). A large tree, reaching 40 to 60 feet in height; branches pale brown; ultimate branchlets ferruginous-pubescent, as are the leaf-buds and young leaves. Leaves coriaceous; often, not always, crowded towards the ends of the branchlets; obovate-oblong, rounded or shortly acute at apex, somewhat cuneate at base; deep-green above, pale bluish-green beneath, yellow when dry, densely rusty-pubescent beneath when young, glabrous on both surfaces when old except for rusty hairs on the midrib and main-nerves beneath; 6 to 8 in. long, 3 to 4.5 in. broad; midrib very thick and prominent; main-nerves 8-14 pairs, very prominent, starting at about an angle of 60° with the midrib, parallel at first, ultimately arched upwards; reticulations not prominent, obliquely joining the main-nerves; petiole 1 to 1.5 in. long, thick, enlarged at base, bordered above by the slightly decurrent margins of the blade. Flowers fasciculate, shortly pedicelled, in the axils of the leaves, above

the scars of fallen leaves or on the year-old wood below the leaves and shoots of the year; pedicels ·1 to ·2 in. long, rusty-tomentose. Calyx-lobes 5, imbricate, ·15 to ·2 in. long, densely rusty-pubescent without, rounded. Corolla tubular-campanulate, ·15 in. long, absent in 2 flowers; lobes very short, obtuse, imbricate. Stamens attached to the base of the corolla-tube; anthers ovate, apiculate, opening by side-slits; staminodes linear-lanceolate. Ovary thickly rusty-pubescent, flattened at top, obscurely 5-lobed, 5-celled; style cylindric. Berry fleshy, somewhat oblong, rounded, tipped with the persistent style, thickly covered with velvety orange-red tomentum and about ·5 in. in diam. Seeds not accurately known.

Penang: Curtis 1452. Perak: Wray 136; King's Collector 6550. Malacca: Maingay (K.D.) 994; Holmberg 704. Singapore: Ridley 6130, 6499; Cantley 89.

Mr. Cantley says that this tree gives the true "Daru-daru" or "Dedâru" wood of the Malay Peninsula.

2. SIDEROXYLON MAINGAYI, Clarke in Hook. f. Fl. Br. Ind. III. 536 (1882). A tree with rusty-pubescent branchlets and young shoots. Leaves membranous; crowded towards the ends of the branchlets; obovate, shortly acuminate at apex, cuneate at base; rusty-pubescent when young, glabrous when old or rusty-pubescent on the midrib and main-nerves; 4 to 8 in. long, 1.5 to 3 in. broad; midrib prominent; mainnerves 8 to 11 pairs, starting at an angle of nearly 60° to the midrib, at first parallel then arching upwards to near the margin; transverse reticulations more or less parallel; petiole 1 to 1.5 in, long, bordered by the decurrent margins of the blade. Flowers fasciculate, sessile or with very short pedicels, chiefly on the previous year's wood below the leaves and shoots of the year. Calyx-lobes 5, imbricate, rounded, rusty-pubescent without, 075 to 1 in. in diam. Corolla tubularcampanulate, as long as or rather shorter than the calyx, wanting in 2 flowers; lobes very short, obtuse, imbricate. Stamens short; filaments slender; anthers ovate; staminodes linear-lanceolate. Ovary thickly rusty-pubescent, flattened at top; style cylindric. Berry fleshy. 1.5 in. in diam., ovoid or globular, full of guttapercha. Seeds 4, compressed, 7 in. long by 3 to 35 in. broad; rounded outside, nearly straight within, the long narrow oblong hilum covering nearly the whole margin; testa hard, shining, dark chestnut-brown; albumen firm, white; cotyledons plane, appressed, elliptic; radicle inferior.

NEGRI SEMBILAN: Ridley 10084. MALACCA: Maingay (K.D.) 993; Hervey. Singapore: Ridley 8928, 9223.

The fruit description is chiefly taken from Maingay's notes in the Kew Herbarium.

3. Sideroxylon Derryanum, King & Gamble, n. sp. A tree; branchlets grey, uppermost appressed-pubescent; innovations with nearly black hairs. Leaves chartaceous; elliptic, very abruptly shortacuminate at apex, broadly cuneate at base; margins more or less recurved; glabrous above, densely silvery-pubescent beneath; 3 to 5.5 in. long, 1.5 to 3 in. broad; midrib prominent, impressed above; main-nerves 12 to 18 pairs, parallel, starting at an angle of about 75° with the midrib, meeting near the margin in a faint intramarginal looped nerve: secondary nerves similar, rather prominent, reticulations few. obscure: petiole 3 to 5 in. long, channelled above, pubescent with nearly black hairs. Flowers fascicled, about 5 together in the axils of the leaves or of the scars of fallen leaves; pedicels 25 in long, tawnypubescent; buds oblong, conical. Calyx-lobes 5, rounded, obtuse, the 2 outer thick very pubescent, the 3 inner somewhat scarious, pubescent only on the middle of the back. Corolla campanulate, 2 in. long; tube ·15 in. long, glabrous within, with a few sparse hairs without; lobes 5, ovate, imbricate, margins recurved. Stamens 5, short, inserted at the top of the tube; filaments conical; anthers ovate-cordate, dehiscing by side-slits; staminodes subulate, glabrous. Ovary villous, obscurely 5-lobed, 5-celled; style very short; stigma obscurely 5-lobed. Berry oblong, dark blue, glabrous, the top flat and crowned with the remains of the style, '6-7 in. long, 1-seeded. Seed oblong, '6 in. long by 3 in. in diam. truncate obliquely at the base; testa thick, light-brown, striate; hilum rather small, sub-basal; albumen thin; cotyledons thick; radicle small.

PERAK: Derry-Curtis 3641.

The colour of the silvery under-surface of the leaves is difficult to describe—it is sometimes dark and smoky-looking.

4. Sideroxylon ferrugineum, Hook. & Arn. Bot. Beech. Voy. 266, t. 55 (1841). A small tree; branches rough, ultimate branchlets ferruginous-pubescent like the leaf-buds and young leaves, branchlets with a raised line downwards from each leaf or scar of a fallen leaf. Leaves coriaceous; obovate or oblong-lanceolate, rounded or bluntly acute at apex, attenuate at base; shining above, densely appressed ferruginous-silky beneath when young, ultimately nearly glabrous; 2.5 to 6 in. long, 1 to 3 in. broad; midrib prominent; main-nerves 10 to 12 pairs, fairly prominent, especially above, starting at about an angle of 60° with the midrib, at first nearly parallel then arching upwards to meet near the margin; secondary nerves similar, reticulations oblique; petiole '5 to '7 in. long, the edges bordered by the decurrent margins of the blade, enlarged at base. Flowers fasciculate, shortly pedicelled, in the axils of

the leaves or above the scars of fallen leaves on year-old wood below the leaves and shoots of the year; pedicels 1 to 2 in. long, covered like the obtuse buds with rusty tomentum. Calux-lobes round. 025 to .075 in. in diam., with scarious margins, closely imbricate, rustvpubescent outside. Corolla campanulate, 1 in. long; tube short; lobes 5, imbricate, rounded, crenulate, sparingly pubescent near the base within, in 2 flowers wanting or deciduous. Stamens very short, attached to the corolla-tube above the base; filaments linear; anthers rounded, opening by marginal slits; staminodes subulate or somewhat hastate, acuminate. Ovary depressed, obscurely 5-lobed, pubescent; stigma short, cylindric, with 5 minute punctiform styles. Berry ovoid, shining 35 by 3 in., 1-2-seeded. Seeds ovoid, 25 by 15 in.; testa shining, dark brown, thick; hilum large, oblong; albumen thick; cotyledons flat. A. DC. Prod. VIII. 178; Clarke in Hook. fil. Fl. Br. Ind. III. 537. S. attenuatum, A. DC. l.c.; Wight Ic. t. 1590: Kurz For, Fl. II. 117, and in Journ. As. Soc. Beng. XLVI. ii. (1877) 229. Mimusops? attenuata, Wall. Cat. 4150.

KEDAH: Langkawi, Curtis. PENANG: Curtis 273, 704. PERAK: Scortechini 1463; King's Collector 1224. MALACCA: Maingay (K.D.) 982; Griffith (K.D.) 3604; Goodenough 1735. SINGAPORE: Wallich 4150; Lobb 319; Ridley 5643, 5908. A sea-shore tree, found also by Ridley on Tiuman Island and at Kwala Pahang (Trans. Linn. Soc. Ser. 2. III. 317).—DISTRIB. Burma, Andaman Islands, Nicobar Islands, Malay Archipelago to the Philippines and S. China.

5. Sideroxylon firmum, Pierre; Burck in Ann. Jard. Buit. V. 17, tab. III. (1885). A small tree; branchlets thick, striate, brown; innovations ferruginous-pubescent. Leaves coriaceous; oblong-lanceolate, shortly acuminate at apex, narrowly acute at base; glabrous above, rustypubescent on the nerves beneath and on young leaves; margins recurved; 4 to 5 in. long, 1 to 1.5 in. broad; midrib strong, prominent, impressed above; main-nerves 12 to 16 pairs, very prominent, about 2 to 3 in apart. starting at an angle of about 40° with the midrib, parallel, curved near and along the margin; reticulations transverse, very regular and prominent; petiole 1 to 1.5 in. long, channelled above and bordered by the decurrent margins of the blade, rusty-pubescent. Flowers fascicled, 4 to 6 together in the axils of the leaves; pedicels variable, ·3 to ·6 in. long, rusty-pubescent, slender in flower, thickened in fruit. Calyx-lobes 5, rounded, imbricate, 15 in. long, densely rusty-pubescent, 3 outer thick, 2 inner more or less scarious on the margins. Corolla campanulate, :15 in. long, 5-lobed, glabrous within, slightly hairy without; tube rather short; lobes oblong, rounded. Stamens inserted on the top of the tube; filaments glabrous; anthers ovate-apiculate;

staminodes subulate, about 05 in. long. Ovary villous; style clavate, glabrous. Fruit an oblong or somewhat obovoid berry, depressed at apex, glabrous, fleshy, supported by the somewhat enlarged persistent calyx-lobes, seed usually 1. Seed oblong, obtuse above, somewhat pointed below, little compressed, 6 in. long, 25 in. broad and thick; testa chestnut-brown, shining, crustaceous; hilum linear, flat, occupying nearly the whole inner face of the seed; albumen thick; cotyledons leafy, flat, oblong, 3-nerved; radicle inferior, pointed. Chrysophyllum firmum, Miq. Fl. Ind. Bat. Suppl. 579.

Penang: at West Hill, Curtis, 1575.—DISTRIB. Bangka, Teysmann; Philippines.

The Bangka specimens have the leaves up to 2.5 in. broad, but in other respects we find no difference from Teysmann's type in the Penang plant.

Species Imperfectly Known.

6. SIDEROXYLON WALLICHIANUM, G. Don Gen. Syst. IV. 28 (1837). A tree (?); branchlets pale brown, ferruginous-villous as are the innovations. Leaves chartaceous; elliptic-obovate, obliquely acuminate at apex, cuneate at base, crowded towards the ends of the branchlets; 6 to 8 in. long, 3 to 4 in. broad; midrib thick; main-nerves 6 to 7 pairs, curved upwards, distant, reticulations prominent; petiole thick, densely tawny-pubescent. Calyx-lobes apparently 5, short, rounded, rusty-pubescent. Miq. Fl. Ind. Bat. II. 1037. S. (?) rugosum, Wall. Cat. 4158.

The only sheet of this is in the type Herbarium of Wallich's plants with the Linnean Society of London. The remains of flowers are very slight, but they seem to show that the plant belongs to this genus. The note "a small plant growing on crocks—flowers white—from the hills" attached to the sheet, seems to refer to some other plant, for the specimen itself has every appearance of having come from a tree.

4. Isonandra, Wight.

Trees with milky juice. Leaves coriaceous, entire, alternate, penniveined, the main-nerves and midrib prominent, the rest usually rather obscure. Flowers small, in axillary shortly pedicellate clusters in the axils of present or fallen leaves. Calyx of 4 segments, the two outer opposite, more or less valvate; the two inner also opposite, imbricate. Corolla tubular, campanulate; lobes 4, much imbricate, somewhat twisted. Stamens 8, sub-equal, attached near the base of the corolla, both opposite to and alternate with the lobes; filaments short; anthers lanceolate, sagittate at base, extrorse; staminodes absent. Ovary 4-celled, villous; style linear. Berry somewhat small, ovoid or oblong with a fleshy pericarp. Seed usually 1 only, scarcely flattened; testa thick, shining, crustaceous; hilum

lateral, long; albumen fleshy, cotyledons flat, radicle inferior.—DISTRIB. About 7 species, 6 of which in South India and Ceylon.

1. ISONANDRA PERAKENSIS. King & Gamble, n. sp. A small tree reaching 30 to 40 feet in height; ultimate branchlets, leaf-buds and young leaves appressed greyish-brown-pubescent. Leaves coriaceous: obovate-oblong, rounded at the apex, cuneate sometimes unequally at the base; the margins reflexed, glabrous and dull above. thickly brown-pubescent beneath: 2 to 3.5 in. long. 1 to 1.5 in. broad; midrib prominent; main-nerves 8 to 10 pairs at about 60° with the midrib, reticulations very inconspicuous; petiole 2 to 3 in. long, rather stout. Flowers fasciculate, on very short, 1 in. long, thick, angular pedicels in the axils of upper leaves; buds 15 in. long, obtuse, brown-appressed-pubescent. Calux of 4 lobes, an outer pair and an inner pair, the outer valvate, the inner shining within, minutely ciliate: lobes 15 in, long. Corolla 4-lobed; lobes rounded, about equal to the tube, together about equal to the calyx. Stamens 8, filaments thickened: anthers lanceolate, sagittate at base, extrorse. Ovary slightly hairv. conical, surmounted by a short linear style as long as the calvx; cells 4. Berry oblong, acute, smooth, 4 to 5 in. long. Seeds ellipsoid, acute at apex, scarcely flattened, 35 by 15 in.; hilum large, oblong; testa dark brown, hard, smooth, shining; albumen fleshy; embryo large, cotyledons oblong.

PERAK: at 1,000 to 1,500 feet elevation, King's Collector 7138.

DOUBTFUL SPECIES.

2. ISONANDRA RUFA, King & Gamble, n. sp. A small tree, reaching 20 to 30 feet in height and 4 to 6 in, in diam.; younger branchlets and innovations densely ferruginous pubescent. Leaves membranous; obovate, long acuminate sometimes abruptly at apex, cuneate and finally more or less rounded at base; sparsely pubescent above when young, nearly glabrous when old; roughly pubescent beneath, especially on the nerves; 5 to 7 in. long, 1.5 to 2.5 in. broad; midrib prominent; main-nerves 8 to 10 pairs, irregularly distanced, at first at an angle of about 45° with the midrib, then arching upwards; secondary nerves and reticulations prominent; petiole 3 in. long, slender, rusty-pubescent, channelled above; stipules very short, subulate, rusty-pubescent, very caducous. Flowers solitary or in pairs in the axils of the upper leaves or on the upper branchlets, very small; pedicels slender, 25 in. long, recurved. Calyx-lobes 4, densely ferruginous-pubescent; 2 outer valvate, ovate, 2 in. long; 2 inner imbricate, ovate, somewhat scarious and ciliate on the margins. Corolla tubular-campanulate; 2 to 25 in. long; tube slender, minutely hairy without and near the mouth within; lobes 6 (?), linear oblong, 1 in. long, erect. Stamens 6 (?), 1 in. long; filaments very slender, villous; anthers ovate, penicillate-apiculate. Ovary rounded, glabrous; style slender, curved, 2 in. long. Fruit an oblong berry, about 1 in. long and 5 in. broad. Seed 1, testa thin, shining.

Perak: Scortechini 159; King's Collector 4550, in dense jungle at 500 to 800 feet.

In only one flower were any traces found of the corolla and stamens, and there seemed to be 6 corolla-lobes instead of 4, and 6 stamens instead of 8. We consider it best, however, to leave the species here for the present and until better material is available.

5. PAYENA, A. DC.

Trees with milky juice. Leaves membranous or chartaceous, often silky beneath; stipules caducous. Flowers fascicled, rather few together, in the axils of the leaves on the upper part of the branchlets, pedicellate. Calyx-lobes 4, the 2 outer usually valvate enclosing the 2 inner generally imbricate. Corolla campanulate; tube broad, short; lobes 8, imbricate, in one or two series. Stamens 16, inserted on the corolla-tube; filaments short; anthers usually extrorse, ovate to linear, connective produced in an acumen; staminodes none. Ovary villous, usually 8-celled; style linear-subulate. Fruit an oblong or ovoid fleshy berry, few-seeded. Seeds oblong, usually somewhat compressed; testa crustaceous, shining; hilum oblong or linear, conspicuous; albumen thin; cotyledons leafy, thin, flat, nearly as long and broad as the cavity of the seed; radicle inferior, generally rather conspicuous.—Distrib. About 6 to 7 species, found in the Malay Peninsula and Archipelago.

Flowers large, reaching .75 in. in length :-Leaves 6 to 9 in. long, silky-pubescent beneath.. .. 1. P. Maingayi. .. 2. P. longipedicellata. Leaves 4 to 5 in. long, glabrous on both surfaces Flowers medium-sized or small, under .75 in. in length :-Flowers in fascicles near the ends of the branchlets, having the appearance of a terminal inflorescence :-Flowers moderate-sized, berry obpyriform, acuminate at 3. P. Havilandi. 4. P. Leerii. Flowers small, berry oblong conical, truncate at tip Flowers in fascicles in the axils of the leaves, never apparently terminal:-.. 5. P. lucida. Leaves glabrous, pedicels slender, flowers small Leaves ferruginous-pubescent, pedicels short, flowers .. 6. P. dasyphylla. rather large SPECIES IMPERFECTLY KNOWN.

Leaves sessile ..

.. 7. P. sessilis.

Leaves petiolate :-

Leaves under 4 in. long, obovate or elliptic-obovate, more or less obtuse 8. P. obtusifolia. Leaves over 4 in. long, oblong-lanceolate, acuminate . . . 9. P. selangorica.

1. PAYENA MAINGAYI, Clarke in Hook. f. Fl. Br. Ind. III. 547 (1882). A large guttapercha-yielding tree, reaching 80 feet in height and a considerable girth; branchlets dark brown, smooth, younger branchlets and innovations rusty-tomentose; leaf-buds golden pubescent, scales 2 to ·3 in. long, lanceolate. Leaves chartaceous; oblong, acuminate at the apex sometimes caudately sometimes abruptly, cuneate at the base; glabrous above except on the midrib, covered beneath with a silky golden-brown pubescence, afterwards glabrate; 6 to 9 in. long, 2 to 3 in. broad; midrib prominent, minutely pubescent above or glabrous; main-nerves 20 to 25 pairs, ·3 to ·5 in. apart, starting at an angle of about 70° with the midrib, at first parallel, ultimately ending in a looped intramarginal nerve; secondary nerves between the main-nerves, obscure like the reticulations; petiole 1 in. long, bordered above by the decurrent margins of the blade; stipules linear, subulate, 3 in. long, goldenpubescent, quickly caducous. Flowers fascicled, 2 to 6 together in the axils of the leaves; pedicels slender, .75 in. long, up to 1 in. in fruit and then thickened, clavate, brown-pubescent. Calyx-lobes 4, 4 to 5 in. long, densely brown-pubescent outside; outer pair valvate, ovate-acute, thick; inner pair imbricate, concave, keeled, acuminate, rather thin. Corolla white, campanulate, 6 to 8 in. long, glabrous; tube about 2 in. long; lobes 8, lanceolate, in 2 rows, the outer 4 enclosing the inner 4. Stamens 16, inserted on the top of the tube, 25 in. long; filaments thick; anthers as long as filaments, ovate, extrorse, crowned by a long mucro formed by the produced connective, the mucro ciliate or truncate or bifid at the apex. Ovary ovoid, pubescent, tapering into a subulate 8 in. long style, cells 8. Fruit an oblong, goldenpubescent or nearly glabrous berry up to 1.5 in. long by 8 in. broad, crowned by the remains of the persistent style, and supported by the persistent calyx-lobes, seeds 1 to 2. Seeds oblong, convex on one side, somewhat concave on the other, 1 to 2 in. long by 5 in. broad and ·2 in. thick; testa light brown, shining, crustaceous; hilum conspicuous, slender; albumen thin; cotyledons oblong rounded, 8 in. long by 225 in. broad; radicle rather large, inferior. Pierre in Bull. Linn. Soc. Par. I. 526. Chrysophyllum? molle, Wall. Cat. 4161.

Penang: Curtis 1565. Perak: Scortechini 172, 346; Wray 3423; King's Collector 7223, 7918; in open jungle or rich soil from 300 up to 2,000 feet. Malacca: Griffith (K.D.) 3610; Maingay (K.D.)

990; Curtis 3483. SINGAPORE: Ridley 6239, 6497. Curtis says it is the "Taban Percha" of the Malays.

The drawing of the flower in Engl. & Prantl Naturl. Pflanzen-Fam. IV. i. 132, fig. 69 A-C seems a little doubtful. The identification of Wall. Cat. 4161 seems also doubtful, for Payena Maingayi much resembles in leaf Palaquium Gutta var. oblongifolia.

2. PAYENA LONGIPEDICELLATA, Brace MS. in Herb. Calc. A tree. reaching 100 to 130 feet in height; branches slender, silvery-grev. innovations rusty-pubescent. Leaves chartaceo-coriaceous: oblong or elliptic-oblong, shortly acuminate at apex, rounded unequally at the base; glabrous on both surfaces, margins slightly recurved: 4 to 5 in. long, 1.5 to 2 in. broad; midrib slender, impressed above; main-nerves about 18 pairs, indistinct, starting at about 85° with the midrib, at first parallel, near the margin joined in an intramarginal looped nerve: secondary nerves nearly as prominent as main-nerves, often branching backwards, reticulations few, indistinct; petiole ·7 to ·8 in. long. channelled above and bordered by the margins of the decurrent blade; stipules small, ovate-acute, rusty-pubescent, very caducous. Flowers fascicled, 1-3 together, in the axils of lower leaves or of the scars of fallen leaves; pedicels 1 to 1.5 in. long, slender, curved, striate when dry, clavate above, puberulous: flower-buds conical, large. Calux-lobes 4; 2 outer valvate, ovate-acute, thick, 5 in. long, sparsely rustypubescent; 2 inner lanceolate-acuminate, concave, thickly keeled, 6 in. long, densely tawny-pubescent on the back. Corolla tubular-campanulate, 8 in. long; tube 3 in. long, glabrous; lobes 8, 4 outer enclosing 4 inner, ovate-acuminate, glabrous. Stamens 16, inserted in 1 row, below the top of the tube but alternate ones covered by the others; filaments very short, slender; anthers 15 in. long, ovate, rusty-hirsute, extrorse, the connective produced in a broad mucro divided in 2 diverging lobes at the tip. Ovary oblong, style a little longer than the corollalobes. Fruit not known.

Perak: King's Collector 2940.—Distrib. Borneo, Haviland 3035.

3. Payena Havilandi, King & Gamble, n. sp. A large tree (?); branchlets grey, slender, innovations appressed rusty-pubescent. Leaves chartaceo-coriaceous; elliptic, abruptly acuminate at apex, attenuate usually unequally at base; glabrous above, glabrous beneath except on the midrib which is appressed-rusty-pubescent, margins recurved; 2.5 to 3 in. long, 1.25 to 1.75 in. broad; midrib slender; main-nerves 10 to 12 pairs, not very prominent, rather irregular, starting at about an angle of 60° with the midrib, meeting close to the margin in an intramarginal looped nerve; secondary nerves and reticulations scanty but prominent, raised beneath; petiole .4 to .5 in. long,

channelled above and bordered by the decurrent margins of the blade; stipules small, ovate-falcate, densely ferruginous-pubescent. Flowers fascicled, 3-4 together, in the axils of upper leaves or of terminal leafless branchlets, giving the appearance of a terminal corymbose inflorescence; pedicels ·8 to 1 in. long, densely rusty-pubescent, recurved; buds ovate, 25 in. long, obtuse. Calyx-lobes 4, outer pair rounded, thick, appressed pubescent to nearly glabrous; inner pair thinner, scarious, ciliate. Corolla campanulate, 3 to 4 in. long, longer than the calvx, glabrous; lobes 8, oblong, cordate at base, crenate or ciliate on the margins, veined; tube as long as lobes. Stamens 16, usually in 2 rows: filaments slender, glabrous; anthers ovate, the connective broad and produced in a broad glabrous acumen, sharp in bud, flattened later on. Ovary linear-oblong; style slender, 5 in. long. Fruit an obpyriform fleshy berry, 1.5 in. long and .75 in. broad, surmounted by the persistent conical style, seed 1. Seed oblong, 1 in. long, 6 in. broad, flattened; testa crustaceous, shining, chestnut-brown; hilum narrow, elongated; albumen thick; cotyledons broadly oblong, 5 in. long, nerved; radicle rather large, nearly 15 in. long.

KEDAH: Lankawi Island, Ridley 8329. Penang: Curtis 777. Singapore: Ridley 4959, 9203.—Distrib. Borneo, Haviland 2098, 2320.

P. CROIXIANA, Pierre in Bull. Soc. Linn. Par. I. 524 seems to be this species or very near it. The following is Pierre's description:—

A huge tree. Leaves oval or sub-oblong, long acuminate, glabrous; 2–3 in. long, ·3 in. broad; main-nerves 24 to 28, petiole ·25 in. Flowers 3, axillary, sub-terminal; peduncles ·2 to ·3 in. long, ·6 in. in fruit. Sepals ovate, ciliate. Corolla-tube pubescent without; lobes oblong, truncate at the apex, ciliate; filaments very short; anthers sub-oblong with a long connective, obtuse, pilose on both sides. Ovary 8-celled, tomentose, urceolate at the base of the style. Berry oblong, ·8–1·2 in. long, ·5–·6 in. broad, glabrous, 1-seeded; pericarp ·06 in. thick; hilum under ·04 in. broad, laterally extended over the whole height; cotyledons ·8 in. long; ·02 in. broad, radicle ·14 in. long.

Malacca: St. Pol Lias; Mad. Errington de la Croix in Paris Mus. "Sundek."

4. PAYENA LEERII, Benth. & Hook. f.; Pierre in Bull. Soc. Linn. Par. i. 524 (1885). A tree, reaching 80 to 100 feet in height and a considerable girth; branchlets grey, slender; innovations minutely rusty-pubescent. Leaves chartaceous; elliptic, abruptly acuminate at apex, acute or somewhat rounded at base; upper surface glabrous, shining, lower surface sparsely pubescent to glabrous; margins undulate, recurved; 2 to 4 in. long, 1 to 2 in. broad; midrib prominent, impressed

above: main-nerves 14 to 18 pairs, slender, about 2 in. apart, inconspicuous, more or less parallel, starting at an angle of about 80° with the midrib, straight almost to the margin where they are connected by a looped intramarginal nerve; secondary nerves many, forking backwards, reticulations faint; petiole slender, 75 in. long, channelled above by the decurrent margins of the blade; stipules short, subulate, pubescent, very caducous. Flowers fascicled, 3-4 together, in the axils of upper leaves. or on terminal leafless branchlets, giving the impression of a terminal inflorescence; pedicels slender, '4 in. long, pubescent. Calyx-lobes 4, ·15 in. long, the 2 outer ovate-valvate, minutely pubescent; the 2 inner ovate, truncate at apex, almost scarious on the margins, pubescent. imbricate. Corolla campanulate; tube .05 in. long, glabrous; lobes 8, imbricate, the 4 rather smaller outer embracing the 4 larger inner, ovate-obtuse, 15 in. long. Stamens 16, inserted in one row on the top of the corolla-tube, those opposite the lobes longer than and behind those alternate with them; filaments very short, hairy; anthers ovate, .075 in. long, extrorse, the connective produced in a rather thick penicillate mucro. Ovary villous, depressed, obscurely 8-lobed; style subulate, glabrous above, pubescent below, 2 in. long; cells 8. Fruit an ovate-oblong conical reddish-green berry, 1.5 to 1.75 in. long, obscurely ribbed and rough, at first tipped with the conical remains of the style, afterwards truncate seed 1. Seed 1 in. long, about ·4 in. broad, oblong; testa thin crustaceous, dark brown; hilum long, narrow; albumen thin; cotyledons oblong, .85 in. long, .35 in. broad, faintly 3-nerved; radicle small, inferior. Kurz in Journ. As. Soc. Beng. XL. (1871) II. 69; Burck in Ann. Jard. Buit. V. (1885) 56, tab. VIII.; Engl. and Prantl Pflanzenfam. IV. i. 133, fig. 70. Keratephorus Leerii, Hassk. Retzia I. (1856) 101; Mig. Fl. Ind. Bat. II. 1039. Azaola Leerii, Teysm. & Binnend. in Nat Tijdschr. Neerl. Ind. VI. 116.

PERAK: Wray 1539, at 4,900 feet on Batang Padang; King's Collector 523. SINGAPORE: Cantley 20.—DISTRIB. Sumatra, Bangka, Borneo (?), Amboina. Vern. "Getah Sundek." It gives a second-rate variety of guttapercha.

To this species probably belong Ridley 11313, Curtis 3631, and David 10857, all apparently from Sumatra—Vern. "Getah Sundi." The specimens have leaves only.

Curtis' No. 3640 "Getah Sundek" from the Dindings is either this species or P. Havilandi; but the fruit is globose, not elongate or obconical. It seems, however, to have been more or less attacked by insects, and may not show its proper shape.

5. PAYENA LUCIDA, A. DC. Prod. VIII. 197 (1844). An evergreen tree

reaching a height of 60 feet and considerable girth; branchlets slender, dark brown, innovations rusty-tomentose. Leaves chartaceous; elliptic, elliptic-oblong or elliptic-lanceolate, obtusely and rather abruptly caudate-acuminate at apex, acute at base and unequal-sided; glabrous on both surfaces, the margins slightly recurved; 4 to 5 in. long, 1.5 to 2 in. broad; midrib prominent, slender; main-nerves 10 to 12 pairs, not prominent, rather irregular, 3 to 4 in. apart, starting at an angle of about 60° with the midrib, straight at first, arching near the margin to meet in a looped intramarginal nerve; secondary nerves and reticulations rather scanty; petiole 4 in. long, channelled above: stipules very minute, linear, silky-pubescent, caducous. Flowers fascicled, 1 to 4 together, in the axils of upper leaves; pedicels slender, ·7 to 8 in. long, somewhat clavate, minutely silky; buds conical, ·1 to ·2 in. long. Calyx-lobes 4, 2 outer valvate, thick, enclosing 2 inner, broad, ovate, obtuse, ciliate, often scarious on the margins, 2 in. long. Corolla white, campanulate, 2 to 3 in. long; tube short; lobes 8, oblong, obtuse or rounded in 2 rows, 4 outer enclosing 4 inner. Stamens 16, 12 in. long; filaments short, thick; anthers ovate, the connective produced into an obtuse, glabrous, often bifid acumen, cells extrorse. Ovary villous, rounded: style subulate, glabrous, 3 in, long, 6-celled. Fruit an oblong, ferruginous-pubescent berry, 1 to 1.5 in. long, 7 in. broad, 1-seeded. Seed oblong, bluntly acute at both ends, flattened, 8 in. long, 5 in. broad, 3 in. thick; testa chartaceous, chestnut-brown, shining; hilum about :15 in. broad occupying the whole inner edge; albumen thick; cotyledons oblong, thin, flat, faintly nerved as the leaves, 6 in. long, 4 in. broad; radicle rather large, inferior. Kurz For. Fl. II. 121, Journ. As. Soc. Beng. XL. ii. 69, and XLVI. ii. 230; Clarke in Hook. f. Fl. Br. Ind. III. 547; Pierre in Bull. Soc. Linn. Par. I. 525. Mimusops lucida, Wall. Cat. 4147; G. Don Gen. Syst. IV. 35 (not of Poir.).

Penang: Wallich 4147. Perak: Scortechini 1989; Wray 2266, 3114, 3191, 3482; King's Collector 3364, 3734, 6636. Singapore: Lobb 307; Ridley.

Var. Wightii, Clarke in Hook. f. Fl. Br. Ind. III. 548. Leaves large, up to 6 in. long and 2.5 broad, coriaceous; pedicels stout; sepals large, rusty-tomentose. Payena polyandra, Bth. & Hook. f.; Pierre in Bull. Linn. Soc. Par. I. 526. Isonandra polyandra, Wight Ic. t. 1589. Keratephorus Wightii, Hassk. in Retzia I. 101.

Of this variety Clarke makes two forms, which he distinguishes chiefly by the former having short acuminations to the leaves, the latter long acuminate leaves. We have separated the material into these two groups as well as we can.

Form (1): Leaves up to 6 in. long, 2.5 in. broad, abruptly acuminate, shining

above, ferruginous-red beneath when dry; flower-buds ovoid, $\cdot 2$ in. long or more, rusty-pubescent. Pedicels stout, clavate; fruit oblong, depressed at top; anther-connective not so broad as in P. lucida.

Malacca: Griffith (K.D.) 3605 (part); Maingay (K.D.) 194; Hervey; Derry 937; Holmberg 794; Goodenough 1977. Perak: King's Collector 8705.

Form (2): Leaves up to 6 in. long, oblong-lanceolate, long-acuminate, reddish beneath when dry; nerves more prominent than in *P. lucida*; pedicels slender, ·8 to 1·2 in. long; buds ovoid, sometimes flattened, ·2 to ·3 in. long, rusty-pubescent; young fruit oblong conical, tipped by the persistent style; old fruit oblong, over 1 in. long. *P. costata*, King MS. in Herb Calc.

Malacca: Griffith (K.D.) 3605 (part); Maingay (K.D.) 989; Goodenough 1853; Derry 654; Curtis 3644, 3660. Penang: Curtis 1516. Perak: King's Collector 3734, 4081, 7842, 7957, 10466, 10496, 10978. Pahang: Ridley 2672. Selangor: Goodenough 10545. Singapore: Ridley 3995, 5070, 6508, 11305.

Var. nigra, King & Gamble. Leaves much larger than in the specimens of true P. lucida, elliptic, long caudate-acuminate at apex, more or less rounded at base, undulate on the margins, 6 to 8.5 in. long, 2.5 to 4 in. broad; main-nerves and intramarginal nerve very prominent, raised beneath; flower-buds and pedicels often golden-pubescent. Flowers as in P. lucida.

PERAK: Wray 1170; Scortechini.

P. Lowiana, Pierre in Bull. Soc. Linn. Par. I. 524, seems to be one of the varieties of *P. lucida* or a species allied to it. The following is Pierre's description:—

A huge tree, Leaves with petiole '4 in. long; blade 5 in. long, 1·2-1·6 in. broad, oblong-lanceolate, obtusely acuminate, glabrous; main-veins 24, distant. Fruiting peduncles axillary, 1-1·2 in. long, solitary. Berry oblong, 1·3 in. long by '8 in. broad, sub-glabrous, crowned at the top with the remains of the style. Seed solitary, 1·1 in. long, '35 in. in diam., erect; hilum lateral, '08 in. broad; cotyledons oblong, attenuate at the apex, '8 in. long by '2 in. broad; radiele '15 in. long. P. lucida MS. in Herb. Mus. Par.

PERAK: Sir Hugh Low; St. Pol Lias No. 272.

6. Payena dasyphylla, Pierre in Bull. Soc. Linn. Par. I. 527 (1885). A large tree, reaching 80 to 100 feet in height and considerable girth; branches spreading, branchlets greyish-brown, moderately thick; innovations densely ferruginous-pubescent. Leaves membranous; oblong or elliptic-oblong or obovate-oblong, often unequal-sided; acuminate at apex, acute, cuneate or somewhat rounded at base; glabrous above except on the midrib and near the base, densely ferruginous-pubescent beneath, when old nearly glabrous; 4 to 8 in. long, 1.5 to 3 in. broad; midrib thick, pubescent on both surfaces; main-nerves 12 to 16 pairs, unequally spaced, starting at about 60° with the midrib, produced straight to meet a looped intramarginal nerve; secondary

nerves rather prominent, reticulations irregular; petiole 5 in. long, thick, densely rusty-pubescent, channelled above; stipules subulate, rusty-pubescent, short, early caducous. Flowers fascicled, 1 to 3 together, in the axils of the leaves; pedicels thickly rusty-pubescent, ·4 to ·6 in. long, somewhat enlarged in fruit; buds ovoid. Calyx-lobes 4, 2 outer thick, valvate, 3 in. long, triangular-rounded, densely rustypubescent; 2 inner concave, slightly imbricate, 35 in. long, thickly keeled, scarious on the margins and ciliate, rusty-pubescent around the keel. Corolla tubular-campanulate, 3 in. long; tube 1 in. long, glabrous; lobes 8, the 4 outer enclosing the 4 inner but inserted in one row, oblong, obtuse. Stamens 16, 175 in. long, inserted on the top of the tube; filaments 05 in. long, villous; anthers nearly linear, extrorse, the connective produced in a 05 in. long, blunt or even bifid acumen. Ovary conical, villous as is the base of the 35 in. long subulate style. Fruit an ovoid densely tawny-pubescent berry 75 to 1 in. long, umbonate at the tip and crowned with a portion of the style. Seeds ·4 to ·5 in. long, elliptic-acute; testa dark brown, shining; hilum narrow; albumen thin. Burck in Ann. Jard. Buit. V. 51. Isonandra dasyphylla, Miq. Pl. Jungh. 201 and Fl. Ind. Bat. II. 1038; de Vriese Journ. Bot. Neerl. I. 256.

Perak: Scortechini 1242; King's Collector 2611, on Larút Peak at 3,000 to 3,500 feet.—Distrib. Sumatra, Java.

De Vriese says the gutta is only used for adulteration, but that Motley did not agree in this belief.

VAR. glabrata, King & Gamble. Lower surface of the leaves nearly glabrous, apex abruptly long-acuminate; pedicels 8 to 1 in. long; fruit nearly spherical.

Perak: Scortechini 536. SINGAPORE: at Selitar, Ridley 5644.

7. Pavena sessilis, King & Gamble, n. sp. A tree (?); branchlets grey, rough, uppermost somewhat angular when dry. Leaves coriaceous, sessile; obovate, obtuse or emarginate; glabrous on both surfaces, margins recurved; 2 to 4 in. long, 1 to 1.5 in. broad; midrib prominent, raised on both surfaces; main-nerves not prominent on the upper surface, raised on the lower, about 8 pairs, at about 50° with the midrib, straight but soon anastomosing with the prominent reticulations which are also raised on the lower surface; stipules ovate, acute or obtuse, glabrous, caducous. Flowers fascicled, 2 to 3 together, on small tubercles in the axils of upper leaves; pedicels slender, black, 5 in. long, supported by small hard glabrous bracts. Calyx-lobes in fruit 4, 2 in. long, ovate-acute, glabrous; rest of flower not seen. Fruit a globose glabrous berry, black when dry, prominently surmounted by the

persistent long curved style; cells apparently 4 to 6. Seeds oblong, obtuse at top, acute at base, ·3 to ·4 in. long, rounded on the outer, straight on the inner side; hilum long, narrow; testa thin crustaceous, brown; albumen rather thin; cotyledons oblong, flat, ·15 to ·2 in. in length; radicle rather large,

SINGAPORE: Ridley 5076.

8. PAYENA OBTUSIFOLIA. King & Gamble, n. sp. A tree; branchlets stout, grevish-brown, prominently marked by the scars of fallen leaves and the tubercles of fallen flower fascicles, young branchlets and leaves rusty-brown in colour. Leaves coriaceous: clustered at the ends of the branchlets, obovate or elliptic-obovate, obtuse, emarginate or shortly acute at apex, cuneately attenuate at base; glabrous on the upper surface, rusty-coloured and sometimes pubescent on the lower; 2.5 to 3 in. long, 1 to 1.5 in. broad; midrib stout, main-nerves 10 to 12 pairs. starting at about 60° with the midrib, slightly curving upwards, inconspicuous above as are the reticulations; petiole 5 to 75 in long. channelled above by the decurrent margins of the blade Flowers fascicled. 4 to 8 together (to judge by scars only) in the axils of the leaves, or of the scars of fallen leaves; pedicels 5 in. long, clavate. pubescent: buds about 3 in. long, truncate, Calux-lobes 4, 2 outer valvate, ovate-acute, 3 in, long, pubescent; 2 inner imbricate, ovate. golden-pubescent on the back, ciliate on the margins. Corolla not seen. Ovary ovoid-conical, glabrous, 8-celled; style :35 in. long, linear. Fruit not seen.

PERAK: Scortechini 340.

9. PAYENA SELANGORICA, King & Gamble, n. sp. A tree (?); branchlets dark brown, rough. Leaves chartaceo-coriaceous; oblong-lanceo late, acuminate at apex, narrowly attenuate at base, glabrous above, slightly pubescent on the sides of the midrib beneath; 4 to 6 in. long, 1 to 1.7 in, broad; midrib prominent, impressed and keeled above; main-nerves about 16 pairs, indistinct, parallel, at about 80° with the midrib, straight at first, anastomosing near the margin with the secondary nerves and reticulations, which are visible but not prominent; petiole .5 to .7 in. long, channelled above, enlarged at base. Flowers fascicled, 2 to 3 together, in the axils of the leaves; pedicels rather thick, 6 to 8 in. long, striate, appressed rusty-pubescent. Calyx-lobes 4, outer pair valvate 3 in. long, ovate-acute, thick below, thinner above; inner pair oyate, 25 in. long, scarious on the margins; both appressed rusty-pubescent; rest of flower not seen. Ovary pubescent, cylindrical. depressed at top; fruit immature, seed apparently albuminous, with an elongated hilum.

SELANGOR: Ridley 7387.

6. Bassia, Linn.

Trees with milky juice. Leaves coriaceous or chartaceous, often clustered at the ends of the branchlets; stipules caducous. Flowers fascicled, in the axils of the leaves or of the scars of fallen leaves. pedicellate, pedicels frequently reflexed. Calyx-lobes 4, the 2 outer usually valvate, enclosing the 2 inner imbricate. Corolla campanulate; tube broad; lobes 6 to 12, contorted in bud, erect in flower, imbricate. Stamens twice the number of the corolla-lobes or more, inserted in one or more rows on the corolla-tube; filaments usually short; anthers generally lanceolate, laterally or extrorsely dehiscing; connective generally produced in an acumen; staminodes none. Ovary villous, 4-12-(usually 6-8-) -celled; style linear, subulate, more or less elongate. Fruit a globose or oblong or ovoid berry, few-seeded. Seeds ellipsoid, usually compressed; testa crustaceous, shining; hilum oblong or linear, conspicuous; albumen none; cotyledons thick, fleshy; radicle small.— DISTRIB. About 40 species, found in India, Ceylon, the Malay Peninsula, and Malay Archipelago.

In several of the species the fruit is unknown, and some of these may prove, when it becomes available, to belong to Payena, which is hardly separable except by the

important character of having albuminous seeds and leafy cotyledons.

We have not followed Baillon and Engler in changing the name of this genus to Illipe, as we agree in the opinions expressed by Drs. Trimen ("Flora of Ceylon") and Cooke ("Flora of Bombay") that the word Illipe was not intended by König to be employed as the name of a genus, but was merely mentioned as being the vernacular name employed by the natives of Malabar for one of the species.

Flower-buds large, nearly '75 in. long, conical; intramarginal nerve of leaves prominent; pedicels thick, 1.5 to 2 in. long	1.	В.	aristulata.
Flower-buds moderately large, about '4 in. long, globose; intra- marginal nerve present; pedicels short, about '4 in. long:—			
Intramarginal nerve conspicuous; leaves 10 to 14 in. long	2.	B_{\bullet}	Kingiana.
Intramarginal nerve faint; leaves 4 to 6 in. long	3.	B.	Kunstleri.
Flower-buds moderately large, 4 in. long or rather less, conical:—			
Leaves large, over 6 in. long; main-nerves prominent:—			
Pedicels over I in. long; leaves coriaceous, silky-pubescent			
beneath; main-nerves straight, intramarginal nerve present;			
connective of anthers penicillate	4.	B.	penicillata.
Pedicels under '6 in. long; leaves chartaceous, sparsely pubescent beneath; main-nerves curved, no intramarginal			
nerve; connective of anthers not penicillate	5.	B.	malaccensis.
Leaves moderate-sized, under 6 in. long; main-nerves not			
prominent	6.	B.	Curtisii.
Flower-buds small, under 3 in. long, usually conical, generally			
in many-flowered fascicles :—			
Pedicels usually under 5 in. long :—			
Pedicels and flower-buds densely tawny-pubescent; connec-			
tive of anthers produced in a long point	7.	B.	laurifolia.
호마 없었다. 그리고 나는 사회가 얼마를 하지만 하는데 그 사이를 가는 하는 것이 되었다. 한 경기에 살려가 있다.			

Pedicels and flower-buds thinly rusty-pubescent; connective of anthers produced in a short ciliate point .. 8. B. rupicola. Pedicels .5 in. long or longer :-Flowers fascicled in the axils of upper leaves generally. rarely on old wood below them :-Leaves glabrous, coriaceous, main-nerves indistinct .. 9. B. perakensis. Leaves grey-silky-pubescent beneath, almost coriaceous, main-nerves distinct but not prominent .. 10. B. argentea. Leaves only slightly pubescent beneath, chartaceous, main-nerves very prominent 11. B. Braceana. Flowers fascicled chiefly in the axils of the scars of fallen leaves, on old wood :-Leaves chartaceous, elliptic; main-nerves prominent .. 12. B. longistyla. Leaves coriaceous, oblong; main-nerves not prominent:-Main-nerves of leaves (under 6 in. long) curved upwards, but no intramarginal nerve; anther-connective long-apiculate 13. B. cuprea. • • Main-nerves of leaves (over 6 in. long) meeting in an intramarginal nerve; anther-connective shortly apicu-.. 14. B. Motleyana.

SPECIES OF WHICH FLOWERS ARE IMPERFECTLY KNOWN.

Leaves under 5 in. long, obovate, obtuse, greenish-brown when dry 15. B. cuneata.

Leaves 5 to 7 in. long, oblong-lanceolate, greyish-green when dry 16. B. penangiana.

Leaves 6 to 8 in. long, obovate-oblong, orange-red when dry ... 17. B. erythrophylla-

1. Bassia aristulata, King & Gamble, n. sp. A tree; branchlets stout, brown, lenticellate. Leaves coriaceous; oblong, shortly and rather suddenly acute at apex, somewhat rounded unequally and then decurrent at base; glabrous on both surfaces except on the midrib beneath; margins slightly recurved; 6 to 10 in. long, 3 to 4 in. broad; midrib thick, prominent, impressed above; main-nerves 24 to 28 pairs, conspicuous, parallel, 3 to 4 in. apart, starting at about 75° with the midrib, scarcely curved, meeting in a conspicuous intramarginal looped nerve; reticulations oblique, not prominent; petiole 1.5 to 2 in. long, grooved above, much thickened below. Flowers fascicled, about 2 to 6 together, in the axils of the leaves or of the scars of fallen leaves, on very short tubercles; pedicels thick, 1.5 to 2 in. long, densely golden-pubescent, flattened under the flower; buds elongate, conical, nearly 75 in. long. Calyx-lobes 4, 5 to 7 in. long; the 2 outer valvate, triangular-ovate, pubescent; the 2 inner imbricate, concave, ovate, pubescent. Corolla-tube short, 2 to 3 in. long, funnel-shaped, densely pubescent inside; lobes 8 to 9, oblong-lanceolate, 4 in. long, pubescent without. Stamens many, up to 36, in 2 or 3 rows, lowest row about 8 to 9, second row 16 to 18, third row 8 to 9, inserted on the top of the corolla-tube; filaments very short, pubescent; anthers oblong, thin, 2 in. long, opening along their edge; connective black, prominent, ending in a long sharp awn, the anthers usually twisted half round. *Ovary* silky-pubescent, flat at top, style glabrous about equal to corolla, cells 10 to 12. *Fruit* not known.

PERAK: at Goping, Scortechini 1984.

Said by Scortechini to give a guttapercha.

2. Bassia Kingiana, Brace MS. in Herb. Calc. A tree, reaching 50 to 60 feet in height, and 10 to 15 in. in diam.; branchlets thick. Leaves coriaceous, dark green; obovate-oblong, rounded and then shortly and abruptly acuminate at apex, cuneate at base; glabrous on both surfaces, margins slightly reflexed; 10 to 14 in. long, 3.5 to 4.5 in. broad; midrib very strong, prominent; main-nerves about 20 pairs, conspicuous, 5 to 7 in. apart, starting nearly at right angles to the midrib and curving upwards to meet in a conspicuous intramarginal looped nerve; secondary nerves few but prominent; reticulations distant, not numerous; petiole 2 in. long, grooved above, swollen at base, and then conspicuously rugose when dry; stipules subulate-acuminate from a broad base, very quickly caducous. Flowers fascicled, about 3 to 5 together, on small tubercles above the scars of fallen leaves on the previous year's wood; pedicels recurved, thick, 4 in. long, enlarged above, covered as also the calyx with appressed tawny pubescence; buds globose, about 4 in. long. Calyx-lobes 4, 4 in. in diam.; outer 2 imbricate, rounded emarginate, thick; inner 2 also imbricate, concave, ciliate on the margins. Corolla-tube funnel-shaped, 15 in. long, rustyhirsute without, pubescent within; lobes 12 to 16, white, much imbricate or in 2 rows, spathulate, ciliate on the margins, hirsute, 25 in. long. Stamens many, 32 to 36, in 2 rows on the top of the corollatube; filaments 1 in. long, rather stout, densely hirsute; anthers linearoblong, 125 in. long; connective produced into a broad appendage, penicillate at tip, in bud merely aristate. Ovary rounded, villous; style thick, curved, pubescent, 3 in. long, with minute stigmatic lobes; cells about 8. Fruit a globose, thickly tawny-pubescent, berry, .75 in. in diam., surmounted by the long subulate persistent style, seeds 1 to 2. Seed not seen.

Perak: King's Collector 3314, 3678, 7389; in open jungle at 300 to 500 feet. Singapore: Ridley 6238, 6294.

3. Bassia Kunstleri, Brace MS. in Herb. Calc. A tree with spreading branches, reaching a height of 30 to 40 feet and 10 to 15 in. in diam.; branchlets slender, grey, innovations rusty-pubescent. Leaves chartaceous; obovate-oblong or oblong, abruptly acuminate at apex, acuminate at base, glabrous on both surfaces; 4 to 6 in. long,

1.5 to 2 in. broad; midrib slender, prominent; main-nerves 15 to 20 pairs, starting at an angle of about 60° to the midrib and curving upwards to meet in a faint intramarginal looped nerve; secondary nerves and reticulations prominent; petiole slender, 1 to 1.5 in. long, bordered above in its upper part by the decurrent margins of the blade, base enlarged, sometimes twisted. Flowers solitary or fascicled 2 to 3 together in the axils of the leaves, or above the scars of fallen leaves; pedicels thick, ·3 to ·4 in. long, usually recurved, densely rusty- or golden-pubescent like the calyx-lobes and fruit; buds ovoid-orbicular about 4 in. long. Calyxlobes 4, 4 in. long; outer valvate, ovate-orbicular; inner imbricate, concave, somewhat emarginate, thin and ciliate on the edges. tubular-campanulate; tube about 125 in. long, glabrous on both sides; lobes 16, in 2 rows, very much imbricate, shortly spathulate, rounded at top, fimbriate on the margins, shortly pubescent within, 3-nerved. Stamens about 32, in 2 rows, mixed with long unicellular brown hairs; filaments thick, about 0.5 in. long; anthers oblong, opening by marginal slits, often twisted half round; connective conspicuous, produced in a sharp mucro. Ovary rounded, villous; style subulate, 5 to 7 in. long; cells about 8. Fruit an ovoid densely pubescent brown berry, 8 to 1 in. long, 1-2-seeded, surmounted by the persistent style. Seed ovoid, obliquely pointed below, rounded above, '7 in. long, '4 in. in diam., sometimes flattened on one side; testa thin, crustaceous, chestnutbrown, shining; hilum very large, obovate; albumen none; cotyledons thick, 5 in. long, ovate; radicle small, pointed.

Perak: on Larút peak, at 500 to 2,600 feet, King's Collector, 3241, 3547, 3964, 6410; Wray 2643, 3201; Curtis 3694; Ridley 5536.

4. Bassia Penicillata, King & Gamble, n. sp. A large tree, reaching 60 feet in height with a girth of 4 feet; ultimate branchlets and innovations densely ferruginous-pubescent. Leaves coriaceous; oblong or somewhat obovate-oblong, shortly and abruptly acute at apex, unequally rounded at base; glabrous above, thickly golden-silkypubescent beneath when young, afterwards glabrate; margins recurved; 6 to 10 in. long, 2.5 to 3.5 in. broad; midrib thick, prominent, impressed and keeled above; main-nerves 24 to 28 pairs, conspicuous, parallel, ·3 to ·5 in. apart in large leaves, starting at about 80° with the midrib, curved only near the margin to meet in an inconspicuous looped intramarginal nerve; secondary nerves many in large leaves; reticulations oblique, not prominent; petiole 1.2 to 1.5 in. long, thickened below. Flowers fascicled, about 1 to 4 together in the axils of the leaves, on very short rusty-pubescent tubercles; pedicels 1 to 1.2 in. long, slender, pubescent; buds conical. Calyx-lobes 4, sometimes 5, 4 in. long; outer pair ovate-acuminate, densely rusty-pubescent, thick; inner pair,

sometimes 3, ovate acuminate, thinner, pubescent on the back, ciliate and more or less scarious on the margins. Corolla campanulate, 4 in. long; tube nearly 2 in. long, glabrous outside, densely ferruginous hairy within in the upper half; lobes 10 (?), lanceolate, acuminate, as long as tube. Stamens 20 in 1 row, but the 10 opposite the corolla-lobes behind the 10 alternate with them; filaments 05 in. long, hairy; anthers linear-sagittate, extrorse, the connective produced in a long penicillate acumen. Ovary rounded, densely hairy, as is the lower half of the 75 in. long slender style; cells 10. Fruit not known.

PROVINCE WELLESLEY: at Tassek Glugor, Curtis 3737, said to be common. Vern. name "Minjato."

In its leaves this species greatly resembles B. aristulata, but the slender pedicels, smaller flowers, acuminate calyx, and penicillate anthers at once distinguish it.

5. Bassia malaccensis, King & Gamble. A large tree (?); branchlets dark brown, rough, with prominent old leaf-scars, innovations nearly glabrous. Leaves chartaceous or almost membranous; obovate or obovate-oblong, obtuse or shortly and abruptly acute at apex, cuneate at base; glabrous above, sparsely and minutely pubescent beneath when young, glabrous when old; 6 to 12 in. long, 4 to 6.5 in. broad; midrib prominent, thick; main-nerves very conspicuous, 14 to 16 pairs, parallel, in average leaves 5 in. apart, in large ones often nearly 1 in., starting at an angle of 60° with the midrib, at once curving gently upwards to and along the margin; secondary nerves few, reticulations mostly transverse, not prominent; petiole 1 to 2 in. long, slightly bordered above to about half-way down by the decurrent margins of the blade, base much swollen, wrinkled. Flowers fascicled 4 to 8 together in the axils of the leaves or of the scars of fallen leaves, on rather thick pubescent tubercles; pedicels '4 to '6 in. long, pubescent; buds when young rounded-conical. Calyx-lobes 4; 2 outer valvate or slightly imbricate, ovate, bluntly acute or mucronate, rusty-pubescent, 25 in. long; 2 inner imbricate, ovate-acute, margins sometimes scarious, sometimes ciliate, back thickly rusty-pubescent, more or less keeled. Corolla campanulate; tube very short, rarely 1 in. long, with a short. ring of hairs at the mouth inside; lobes 10-12, lanceolate, obtuse, sub-2-seriate, 25 to 3 in. long, glabrous except for a few stiff hairs outside. Stamens 20 to 24 in 2 rows; the inner almost or guite sessile, alternate with the corolla-lobes; the outer with short densely pubescent filaments. longer than the inner ones; anthers narrowly lanceolate with long hairs, opening on the margins; connective produced in a long hair-like acumen. Ovary hairy, elongate, conical, style 25 in. long. Fruit a. fleshy obovate-oblong berry with somewhat flattened top, surmounted

by the persistent base of the style and supported by the persistent calyx-lobes, nearly 1 in. long. Seed 1, oblong, acute at the top, 7 in. long, 35 in. broad, and about 3 in. thick; testa shining, crustacequs, chestnut-brown; hilum 15 to 2 in. broad; albumen none; cotyledons thick, inner face somewhat striate; radicle rather large, inferior. Payena malaccensis, Clarke in Hook. f. Fl. Br. Ind. III. 547. Keratephorus Wightii, Maingay MS. (not of Hassk.).

Malacca: Griffith (K.D.) 3610; Maingay (K.D.) 992. Perak: Wray 1229; Scortechini 314. Singapore: Ridley 2082, 2757, 5643, 6042, 6132, 6133, 6498, 6499, 6500, 6531, 8078, 10159.

Wray says this species gives only a sticky gutta in small quantities.

6. Bassia Curtisii, King & Gamble, n. sp. A tree, reaching 40 to 50 feet in height; branches greyish-brown, strongly marked by the scars of fallen leaves and the prominent tubercles of fallen flowers, innovations very slightly rusty-pubescent, thick. Leaves very coriaceous; clustered at the ends of the branchlets, obovate or sometimes lanceolate-obovate, obtuse emarginate or very suddenly and shortly blunt-acuminate; glabrous on both surfaces, margins strongly recurved; 4 to 6 in. long, 1.25 to 2.5 in. broad; midrib stout, prominent; main-nerves not prominent, 14 to 15 pairs, at an angle of about 70° with the midrib, 3 to 4 in. apart, straight, joined near the margin by a looped intramarginal nerve; secondary nerves prominent, reticulations few; all raised on the under surface; petiole .7 to 1 in. long, rather thick, bordered by the decurrent margins of the blade, base swollen. Flowers fascicled, many (10 to 12) together on prominent tubercles in the axils of the scars of fallen leaves below the leaf-cluster, and covering the branchlets densely for a distance of about 4 in.; pedicels 25 (buds) to 5 (flower) in. long, somewhat angular, decurved, densely pale tawny-pubescent; buds ovoid-conical. Calyx-lobes rounded, obtuse, densely tawny-pubescent, ·2 in. long, the outer pair thick, the inner somewhat keeled, scarious on the margins. Corolla campanulate, rather longer than the calyx; tube short, glabrous except for the ring of hairs at the insertion of the stamens; lobes 8, oblong spathulate, ciliate and hirsute at the tip. Stamens 16; filaments short, slender, villous; anthers ovate-acute, the connective ending in a sharp conical acumen, extrorse. Ovary rounded, villous; style thick glabrous, stigmas minute; cells 8. Fruit an oblong berry, covered without with appressed golden pubescence, 5 to 7 in. long, 5 in. broad, crowned with the persistent style and supported by the persistent calvx; seeds 1-2, placentas thin. Seeds oblong, pointed at the ends; testa crustaceous, shining; hilum narrow; albumen none; cotyledons thick, fleshy, radicle small.

Penang: Curtis 1451, 3536. Perak: Wray 512, Vern. "Gutta Gannu"; Scortechini 1408.

This species comes near both to B. Motleyana, from which it differs in having more coriaceous leaves, larger flowers, and a pubescent fruit; and to B. cuneata, in which the leaves (judging from the poor specimens in Kew Herbarium) are thinner and the fruit larger and nearly glabrous, with more rounded seeds and a broad hilum.

7. Bassia Laurifolia, King & Gamble, n. sp. A tree reaching 60 feet in height and a diam. of 12 to 18 in.; branches spreading; branchlets pale brown, rather thick, innovations densely pubescent with yellowish-tawny hairs. Leaves chartaceous; obovate-lanceolate, gradually acuminate at apex, also at base; glabrous on both surfaces except on the sides of the midrib beneath; 5 to 10 in. long, 1.5 to 3.5 in. broad; midrib prominent, impressed and keeled above; mainnerves prominent, regular, 14 or 15 pairs, about 3 in. apart, starting at about 45° with the midrib, gradually curving upwards; reticulations obliquely transverse, faintly marked; petiole .75 to 1 in. long, slender, glabrous above, tawny-pubescent at base, bordered by the decurrent margins of the blade and marked above by the produced keel of the midrib; stipules linear-subulate, tawny-pubescent, nearly 5 in. long, very caducous. Flowers fascicled, about 6 together, on hairy tubercles in the axils of the leaves or of the scars of fallen leaves near the top of the branchlets; pedicels 4 to 5 in. long, usually recurved, densely tawny-pubescent, thicker in fruit; buds small, conical. Calyx-lobes 4, about 2 in. long, rather narrowly ovate; the outer pair obtuse; the inner acute, all densely tawny-pubescent without, glabrous within. Corolla campanulate; tube 05 in. long with a ring of hairs at the mouth inside; lobes 8, oblong-spathulate, 1 in. long, glabrous. Stamens 14 to 16, 1 in. long; filaments short, thickly hairy; anthers linear-sagittate, the connective produced in a long sharp acumen. Ovary rounded, glabrous; style slender, 3 in. long; cells apparently 8. Fruit a black glabrous oblong berry about 6 to 7 in. long and 4 in. broad. Seed 1, ovoid, •5 to •6 in. long, slightly compressed; testa thin, crustaceous, shining, dark brown; hilum broad; albumen none; cotyledons oblong, fleshy, about 3 in. long and nearly 2 in. broad; radicle inferior, rather large.

Perak: on low ground, King's Collector 3104, 3718, 3720.

Var. obtusa, King & Gamble. Leaves obtuse with an abrupt acumen. Calyx-lobes obtuse, thickened at tip. Corolla-lobes ciliate at the apex, glandular-striate; anthers and produced connective very hirsute.

Penang: Curtis 159, 2254, 3589—a small tree, fairly common. Var. parvifolia, King & Gamble. Leaves smaller than in type; innovations not tawny-pubescent. Calyx-lobes more rounded and glabrous; pedicels longer.

KEDAH: on Kedah Peak, Ridley 5506.

Ridley's No. 2673 from Tahan Woods, Pahang, is very near B. laurifolia, but the pedicels are much longer and the calyx-lobes not tawny-pubescent. The material is insufficient for description.

8. Bassia Rupicola, King & Gamble, n. sp. A tree reaching 40 to 60 feet in height and 15 to 20 in. in diam.; branchlets dark grev, marked by the prominent scars of fallen leaves, innovations puberulous; leaf-bud scales ovate-lanceolate, 25 in. long. Leaves coriaceous; obovateoblong, bluntly acute at apex, cuneately attenuate at base; dull and glabrous on both surfaces; 3.5 to 5.5 in. long, 1.5 to 2 in. broad; midrib thick, conspicuous; main-nerves 8 to 10 pairs, starting at an angle of 45° with the midrib, then curving upwards, sometimes rather indistinct, about 4 in. apart; reticulations many, obscure, obliquely transverse; petiole '5 to 1 in. long, grooved above and bordered by the decurrent base of the blade, swollen below. Flowers fascicled, about 5 together, in the axils of the leaves, on small tubercles; pedicels 15 in. long, ferruginous-pubescent like the calyx and buds. Calyx-lobes 4, 2 outer valvate; 2 inner valvate or imbricate, ovate, 2 to 25 in. long; all more or less recurved and ciliate at tip. Corolla tubular-campanulate, lobes and tube nearly equal, mouth of tube inside with a ring of soft ferruginous hairs; lobes oblong, ciliate at tip, sparsely hairy without, nerves spreading. Stamens 16, inserted above the ring of hairs in the mouth of the tube; filaments slender, .05 in. long, pubescent; anthers ovate-mucronate, tip ciliate, extrorse. Ovary ovoid; style curved, 3 in. long, stigma flat, minute. Fruit not seen.

PERAK: in rocky creeks on Gunong Batu at 1,500 to 2,000 feet, King's Collector 7411.

9. Bassia perakensis, King & Gamble, n. sp. A tree reaching 60 to 80 feet in height and a considerable girth; branchlets thick, dark grey, prominently marked by the scars of fallen leaves and the tubercles on which the flower fascicles grew. Leaves coriaceous; oblong or obovate-oblong, shortly and abruptly acuminate at apex, acuminately narrowed at base; margins recurved, glabrous on both surfaces; 4 to 6 in. long, 1.5 to 2.5 in. broad; midrib stout, prominent; main-nerves slender, indistinct, 14 to 18 pairs, starting at an angle of 50° with the midrib, parallel, straight at first, arching near the margin to join in an intra-marginal looped nerve which is also met by the secondary nerves between the main ones; reticulations faintly marked on both surfaces; petiole .75 to 1 in. long, rather thick, bordered above by the decurrent

margins of the blade, swollen below. Flowers in fascicles of up to 10 to 12, on tubercles in the axils of the leaves or above the scars of fallen leaves on the previous year's wood; pedicels 5 to 6 in. long, slender, flattened below the flowers, densely pubescent at first, afterwards nearly glabrous, recurved in fruit; buds small, conical. Calyx-lobes 4, 2 in. long; 2 upper ovate-acute, densely pubescent, valvate; 2 lower imbricate, also densely pubescent, ciliate on the margins, somewhat keeled, ovate-acute. Corolla funnel-shaped; lobes 8, throat villous. Stamens about 16; filaments short glabrous; anthers sagittate. Ovary globose, villous, 8-celled, style 3 to 4 in. long, stigma minutely lobed. Fruit an ovoid densely pubescent berry about 7 to 9 in. in diam., crowned by the persistent style; seeds 1–2. Seed ovoid-oblong, 65 in. by 35 in., acute at base; testa shining, chestnut-brown, thin, crustaceous; hilum large, oblong; albumen none; cotyledons oblong, 45 in. long, 25 in. broad, radicle very small.

PERAK: King's Collector 512, 3846; Curtis 3695, on the Larut hill up to 2,500 feet.

10. Bassia argentea, Clarke in Hook. f. Fl. Br. Ind. III, 545 (1882) (not of de Vriese). A large tree; branchlets rather thick, greyish-brown. Leaves coriaceo-chartaceous; elliptic or elliptic-oblong, abruptly acuminate at apex, acute and often unequal at base; glabrous above, shining grey-silky beneath when young, nearly glabrous when old; 4 to 7 in. long, 2.5 to 3 in. broad; midrib prominent, thick; main-nerves 13 to 15 pairs, about 4 in. apart, starting at about 60° with the midrib, at first straight then curving upwards; reticulations many, very oblique; petiole 1 in. long, upper part bordered by the decurrent margin of the blade, swollen below and rugose. Flowers fascicled in clusters of 6 to 10 in the axils of the leaves, or above the scars of fallen leaves; pedicels slender, about 5 in. long, appressed-pubescent; buds conical. Calyxlobes 4, outer and inner pairs both valvate; lobes ovate, 2 to 25 in. long, acute, pubescent. Corolla tubular-campanulate, tube 1 in. long; lobes 8 to 9, 15 in. long, linear-oblong. Stamens usually 24, in 3 rows, inserted on the top of the tube on a ring of rusty hairs; filaments very small or none; anthers ovate, densely hirsute, black-apiculate. Ovary rounded, depressed above, villous; style 2 to 3 in. long, villous half-way up, subulate; stigma capitate; cells 8 to 10. Fruit not seen.

MALACCA: Maingay (K.D.) 991, 1524; Derry 941.

Bassia argentea, de Vriese, seems to be a Sideroxylon, cf. Burck & Koord. & Val.

11. Bassia Braceana, King & Gamble, n. sp. A tree with spreading branches, reaching 50 to 70 feet in height and 10 to 20 in. in diam.; branchlets pale brown. Leaves chartaceous; bright green, glossy,

oblong or elliptic-oblong, acuminate both at apex and at base; glabrous above, minutely pubescent on the nerves or in the axils of the nerves beneath; 4 to 8 in. long, 2 to 3 in. broad; midrib thick, impressed above; main-nerves 14 to 18 pairs, regular, parallel, conspicuous, about ·4 in. apart, starting at about 60° with the midrib, arching upwards to ioin near the margin; reticulations oblique, slender but conspicuous. joining the main-nerves more or less horizontally; petiole 8 to 1.4 in. long, grooved above and bordered by the decurrent margins of the blade, thickened and somewhat curved below. Flowers fasciculate. usually 4 to 7 together, in the axils of the leaves, or above the scars of fallen leaves on the last year's wood below; pedicels 4 to 6 in, long, thickened above, otherwise slender, slightly pubescent. Calyx-lobes 4, ·15 to ·25 in. long; 2 outer opposite ovate rounded, enclosing the 2 inner concave rounded; sometimes ciliate on the margins, sometimes slightly emarginate, all more or less golden-pubescent without, enlarged after flowering. Corolla cream-coloured; tube cylindrical, short, about 1 in. long only; lobes more or less spreading, 8 to 9, linear-oblong, 2 in. long, slightly twisted. Stamens 16 to 18, in 2 rows, inserted on the top of the tube inside above a thick ring of tawny hairs; filaments very short; anthers ovate-lanceolate, strigosely hirsute, the connective ending in a long dark acumen. Ovary globose, glabrous; style ·15 in. long, stigmas very minute; cells about 8. Fruit an oblong green fleshy berry, 8 to 1 in. long, crowned by the remains of the style; seed usually 1 only. Seed ovoid, flattened, '8 in. long, '5 in. broad, and 25 in. thick; testa chestnut-brown, shining, crustaceous; hilum elongate. pale, conspicuous; albumen none; cotyledons thick, 5 to 6 in. long, ovoid, somewhat acute; radicle minute.

Penang: Curtis 3063. Perak: King's Collector 1846, 3195, 3275, 3740, 6447, 7584, 10412; Scortechini 314, 1483; Wray 1775, 2613, 2694.

Var. lanceolata, King & Gamble. Leaves narrower, more lanceolate-acuminate; main-nerves closer. Flowers more numerous in the fascicles and fascicles more numerous on the last year's wood. Corolla-lobes often unequal in length, acute. Anthers with the acumen bifid.

PERAK: Wray 189, 1248, up to 3,400 feet.

13. Bassia longistyla, King & Gamble, n. sp. A large tree, reaching 80 to 100 feet in height; branchlets thick, dark greyish-brown, innovations minutely pubescent. *Leaves* chartaceous; elliptic, shortly and rather abruptly acuminate at both apex and base; glabrous on both surfaces; 3.5 to 5 in. long, 1.5 to 2 in. broad; midrib slender; main-nerves 12 to 14 pairs, leaving the midrib almost at right

angles and curving upwards to meet near the margin; secondary nerves somewhat prominent as are the reticulations; petiole '6 to '8 in. long, slender, grooved above. Flowers fascicled, often up to 10 together, on tubercles above the scars of fallen leaves on the last year's wood; pedicels slender, glabrous, '5 to '7 in. long. Calyx-lobes 4, '15 to '2 in. long, ovate, somewhat acute, somewhat pubescent outside, the 2 outer enclosing the 2 inner. Corolla with very short ('05 in. long) cylindrical tube; lobes 8 to 9, rather spreading, oblong-lanceolate, obtuse or emarginate, prominently nerved, glabrous. Stamens 16 to 18, '2 in. long, inserted in 2 rows on the top of the tube above a short ring of tawny hairs; filaments '125 in. long, slender; anthers ovate, '075 in. long, apiculate, extrorse. Ovary cylindrical, style '5 in. long, surmounted by a minute rounded stigma. Fruit unknown.

Perak: King's Collector 2680. Singapore: Ridley 6498 (?).

This species comes very near to B. Braceana, but the anthers differ so much that we hesitate to join them.

13. Bassia cuprea, King & Gamble, n. sp. A tree reaching 60 to 70 feet in height: branchlets thick, brown, uppermost somewhat angular. Leaves coriaceous: oblong, obtuse or emarginate at apex, attenuate at base and somewhat unequal; glabrous above, sparsely hairy on the nerves beneath, otherwise glabrous; 4.5 to 6 in. long, 2.5 to 3 in. broad; of a coppery-brown colour when dry; midrib very thick and prominent; main-nerves 10 to 12 pairs, starting at an angle of about 50° with the midrib, curving upwards to and along the margin; reticulations visible but not strong; petiole thick, '75 to 1 in. long, bordered above by the decurrent margin of the blade. Flowers fasciculate in the axils of the leaves or of the scars of fallen leaves, 2 to 5 or more in a fascicle, fragrant; pedicels '5 in. long, pubescent; buds conical, '3 in. long. Calyx-lobes 4, 25 in. long; 2 outer valvate, broadly ovate, shortly pubescent; 2 inner rounded concave, shallowly emarginate, ciliate and scarious on the margins, pubescent without. Corolla 4 in. long; tube funnel-shaped, '1 in. long, mouth densely brown-hirsute; lobes 8-9. erect or spreading, 3 in. long, oblong, rounded at apex, long brownsilky-pubescent on back, strigosely hairy within. Stamens 18 to 22, inserted on the mouth of the tube; filaments hairy, 05 in. long; anthers ovate-acuminate, 15 in. long, the connective produced in a long usually curved acumen, strigosely hirsute. Ovary oblong, glabrous. 8-10-celled, ending in a style 5 in long surmounted by a minutely 9-10-lobed flat stigma. Fruit not seen.

PERAK: Scortechini 1879.

This species comes near to B. Motleyana, Clarke, but the flowers are much larger and different.

14. Bassia Motleyana, Clarke in Hook. f. Fl. Br. Ind. III. 546 (1882). An erect lofty tree of swampy places; branchlets dark brown. marked by prominent leaf-scars. Leaves coriaceous; elliptic, shortly and abruptly acuminate at apex, cuneate at base, the two sides sometimes unequal; glabrous on both surfaces; 4 to 5 in. long, 1.5 to 2.5 in. broad; midrib prominent, raised above; main-nerves 10 to 12 pairs, irregularly spaced, generally at about an angle of 60° with the midrib, meeting near the margin in a looped intramarginal nerve; secondary nerves prominent. similar to the main-nerves, reticulations few; petiole 8 to 1.2 in. long. rather thick, bordered by the decurrent margins of the blade. Flowers fascicled, many together (10 to 12), in the axils of the leaves or of the scars of fallen leaves below the terminal tuft, often fully clothing the branchlets for a distance of 6 in. or more; pedicels slender, 4 to ·7 in. long, buds ovoid. Calyx-lobes 4, ·15 to ·2 in. long, ovate, obtuse or somewhat acute, sparsely pubescent, the inner pair somewhat scarious on the margins. Corolla campanulate, 15 to 2 in. long: tube short, about \(\frac{1}{3} \) of the whole; lobes 8, 4 outer enclosing 4 inner, oblong-spathulate, obtuse at tip and ciliately ferruginous-pubescent. Stamens 16, inserted on the top of the tube on a ring of long ferruginous hairs; filaments short, slender; anthers ovate-lanceolate, short-apiculate. Ovary rounded, villous, 6-8-celled; style 5 in. long, thick, sparsely pubescent. Fruit an obovoid glabrous berry, acute at top and furnished with the remains of the persistent style; calyx-lobes also persistent; 5 in. long, 3 in. broad, 1-2-seeded. Seeds oblong, acute at both ends; testa crustaceous, shining; albumen none; cotyledons fleshy; radicle small. Burck in Ann. Jard. Buit. V. 44. Isonandra Motleyana, de Vriese in Mig. Journ. Bot. Neerl, I. (1861) 257.

MALACCA: Griffith (K.D.) 3608; Derry 1026. Johore: Ridley 6496. Singapore: Ridley 5645, 5896.—Distrib. Borneo (fide Burck).

De Vriese says the milky juice gives a gutta of bad quality, being more waxy and fragile than that of other kinds.

VAR. Scortechinii, King & Gamble. Leaves much larger, 6 to 8 in. long, 2·5 to 3·5 in. broad, main-nerves 15 or 16 pairs. Fruit nearly globose—a dark green berry, shining when dry.

PERAK: Scortechini, at Port Weld, No. 1550; King's Collector 5454, 6735, on low, wet ground—a tree reaching 60 to 80 feet in height and 15 to 20 in. in diam.

15. Bassia cuneata, Bl. Bijdr. 675. A tree (?); branchlets dark brown, scarred, rather thick. *Leaves* coriaceous; clustered at the ends of the branchlets, greenish-brown when dry, obovate, obtuse-emarginate or very shortly and abruptly acute at apex, cuneate at base;

glabrous, margins slightly recurved; 4 to 5 in. long, 2 to 3 in. broad; midrib stout, prominent, impressed above; main-nerves not prominent, about 20 pairs, nearly at right angles to the midrib, anastomosing near the margin with the secondary nerves; reticulations transverse; petiole ·6 to 1 in. long, bordered by the decurrent margins of the blade. Flowers in axillary fascicles as long as the petiole, not seen. Fruit a globose berry ·75 to 1 in. in diam., 1-3-seeded. Seeds ·5 to ·7 in. long, ·5 in. broad and thick, ovoid, not compressed, pointed at both ends; testa crustaceous, chestnut-brown, shining; hilum very broad (·4 in.); albumen none; cotyledons fleshy, semi-ellipsoidal. Miq. Fl. Ind. Bat. II. 1041; A. DC. Prod. VIII. 199; Clarke in Hook. f. Fl. Br. Ind. III. 546; Koord. & Val. Bijdr. I. 154.

Malacca: Maingay (K.D.) 986. SINGAPORE: Ridley 6502.—
DISTRIB. Java.

16. Bassia Penangiana, King & Gamble, n. sp. A tree (?); branchlets dark grey. Leaves chartaceous; oblong-lanceolate, acutely attenuate at both ends; glabrous, grevish-green when dry; 5 to 7 in long. 1.5 to 2.5 in broad; midrib broad, conspicuous, impressed above and then keeled; main-nerves 10 to 12 pairs, starting at an angle of about 50° with the midrib and curved upwards to and along the margin; reticulations transverse, raised above; petiole 1 to 1.2 in. long, bordered by the decurrent margins of the blade, swollen at base; stipules very small, ovate, pubescent, caducous. Flowers in fascicles of about 5 to 6 in the axils of the leaves; pedicels slender, 4 to 5 in. long, appressed rusty-pubescent. Calyx-lobes 4, ovate, obtusely acuminate, recurved, 2 in. long, lower half thick, wrinkled, upper half thinner, somewhat scarious, sparsely appressed golden-pubescent. Corolla tubular-campanulate, 25 in. long; lobes 8 (?), oblong-spathulate. glabrous within, golden-pubescent without; tube rather shorter than lobes. Stamens 16 (?), inserted in a ring of hairs on the top of the tube; filaments slender; anthers linear-oblong, hirsute, the connective produced in a rather long, somewhat blunt, penicillate mucro. Ovary conical, glabrous; style slender, 3 in. long; cells 8.

Penang: Curtis 1450.

17. Bassia erythrophylla, King & Gamble, n. sp. A tree, 40 to 50 feet in height and 1 foot in diam.; branchlets thick, grey, marked with the scars of fallen leaves and the tubercles of fallen flowers. Leaves coriaceous: obovate-oblong, shortly and bluntly acuminate at apex, unequally attenuate at base; glabrous, orange-red when dry, margins slightly recurved; 6 to 8 in. long, 1.5 to 2.5 in. broad; midrib thick, prominent below, impressed above; main-nerves 10 to 12 pairs, rather irregular, starting at an angle of 60° from the midrib and

curved upwards to and along the margin; reticulations transverse, prominent, raised beneath; petiole 1.5 to 2 in. long, thickened at base, bordered above by the decurrent margins of the blade, younger ones golden-pubescent; stipules linear-subulate, 3 to 4 in. long, quickly caducous. Flowers fascicled, about 5 to 6 together, on raised tubercles above the scars of fallen leaves on year-old wood; pedicels in fruit thick, 5 to 6 in. long, golden-pubescent. Calyx-lobes 4, in fruit ovateacute or rounded, densely golden-pubescent on both surfaces, thick: rest unknown. Fruit a globose, golden-pubescent, berry somewhat depressed at top and bearing the remains of the persistent style, ·5 to ·6 in. in diam. Seed not seen.

Penang: at Highlands, Curtis 3652 (Kew) or 5652 (Calc.).

7. Palaquium, Blanco.

Trees, often of great size and containing a milky juice. Leaves usually coriaceous, obovate or oblong, petioled, entire, sometimes covered beneath with a dense silky or tawny pubescence. Flowers fasciculate, in the axils of the leaves or of the scars of fallen leaves, pedicellate. Calyx of 6 lobes, the outer 3 valvate, the inner 3 imbricate. Corolla usually campanulate, tube short; lobes 6, imbricate, often contorted in bud. Stamens 12 or more (up to 18), opposite to and alternate with the corolla-lobes, those alternate often shorter and sometimes inserted higher up the tube; anthers ovate-lanceolate, dehiscence extrorse, connective produced; staminodes none. Ovary villous, 6-celled; style subulate. Fruit a fleshy, ovoid or ellipsoid, berry, 1-2-seeded. Seeds large, exalbuminous; the testa crustaceous; cotyledons thick, fleshy; radicle pointed, inferior.—DISTRIB. About 50 to 60 species, found in South India, Ceylon, Eastern Bengal, Burma, the Malay Peninsula and Archipelago, the Philippines, and Samoa (1 sp.). DICHOPSIS, Thw. in. Gen. Pl. II. 658.

Pedicels never over '75 in. long, distributed for some distance down the upper branchlets:-

Leaves large, 5 to 12 in. long, obovate-obtuse; branchlets stout, nearly .5 in. thick:-

Leaves nearly glabrous and glaucescent beneath, mainnerves distant, irregular

Leaves ferruginous-pubescent or -tomentose beneath, main-nerves fairly close and regular:-

Leaves appressed-pubescent beneath, midrib glabrous on upper surface

Leaves spreading-tomentose beneath, midrib hairy on .. 3. P. Clarkeanum. upper surface Leaves rarely over 6 in. long, branchlets rarely 25 in.

thick :-Leaves always more or less obovate:- 1. P. obovatum.

2. P. Maingayi.

Leaves golden-silky-pubescent beneath:-4. P. Gutta. Main-nerves close, over 20 pairs 5. P. Oxleyanum. Main-nerves about 1/2 in. apart, under 20 pairs Leaves not or only very slightly silky-pubescent beneath :-Leaves conspicuously red or yellow when dry 6. P. xanthochymum. Leaves not conspicuously red or yellow when dry, usually brown or greenish-brown :-.. 7. P. bancanum. Leaves over 3 in. long .. 8. P. Ridleyi. Leaves 2 to 3 in. long .. 9. P. microphyllum. Leaves under 2 in. long Leaves elliptic, not obovate: Produced connective of anthers bifid at point; leaves .. 10. P. hexandrum. Produced connective of anthers simple at point; leaves .. 11. P. Herveyi. grey-pubescent beneath Pedicels 1 in. long or longer, clustered only at the extreme ends .. 12. P. stellatum. of the branchlets; leaves oblong-lanceolate, 3-6 in. long

1. PALAQUIUM OBOVATUM, King & Gamble. A big tree with a foxy odour (Ridley), evergreen; the branches thick, brown, marked by the very prominent scars of fallen leaves; leaves clustered towards the ends of the branchlets; innovations rusty-pubescent. Leaves coriaceous; obovate-cuneate or obovate-oblong, obtuse or very shortly acute at apex, cuneate at base; recurved and somewhat undulate on the margins; glabrous above, glaucescent beneath; 5 to 12 in. long, 2 to 4 in. broad; midrib thick, prominent, impressed above, much raised beneath; main-nerves about 12 pairs, at an angle of 40° to 45° with the midrib, inconspicuous above, raised and prominent beneath; reticulations many, oblique, obscure; petiole thick, 7 to 1 in, long, bordered above by the decurrent margins of the blade, glabrescent or slightly rustypubescent. Flowers in clusters in the axils of the leaves or on tubercles above the scars of fallen leaves; pedicels 3 to 5 together, 3 to 5 in. long, rusty-pubescent; buds at first globose, afterwards elongate by the growth of the corolla. Calyx-lobes 6; outer 3 triangular-ovate, thick, pubescent outside, 15 in. long; inner 3 imbricate, ovate-obtuse, ·1 in. long, margins scarious. Corolla campanulate; tube very short; lobes 6, imbricate and twisted, 4 to 5 in. long, glabrous without, slightly pubescent within. Stamens 12, the 6 longer opposite to, the 6 shorter alternate with, the lobes of the corolla, ovate lanceolate, apiculate, thickly rusty-villous; filaments as long as anthers, slender, glabrous. Ovary globose; style 5 in. long, subulate, glabrous. Fruit a globose berry, '75 to 1 in. in diam., pulp fleshy, seeds 1 to 2. Seed ovoid, scarcely flattened on one side, pointed at base; testa thin, shining; albumen none, cotyledons fleshy. Dichopsis obovata, Clarke in Hook. f. Fl. Br. Ind. iii. 542. Isonandra obovata, Griff. Notul. iv. 293; Kurz For. Fl. II. 120 and Journ. As. Soc. Beng. XLVI. ii. 230. Bassia? hypoleuca, Miq. Fl. Ind. Bat. Suppl. 582 (fide Kurz).

Penang: Holmberg 783. Malacca: Griffith (K.D.) 3606; Maingay (K.D.) 985, 996; Curtis 3480, 3481, 3482; Hervey 2754; Derry 59, 88; Ridley 10079; Goodenough 1994. Singapore: T. Anderson 122; Ridley.—Distrib. Tenasserim, Sumatra.

Curtis says it gives a low class bastard gutta of little value. Vern. "Niato bunga" "Niato tunbaga" "Niato balam."

2. Palaquium Maingayi, King & Gamble. A tree; stems reaching 60 feet in height and 10 to 15 in. in diam.; branchlets dark brown, rough, about 4 in. in diam., marked by the large scars of fallen leaves; innovations densely short-rusty-pubescent. Leaves chartaceous; obovate, obtuse at apex, cuneate or slightly rounded and more or less auricled at base; margins recurved; glabrous above except on midrib, thickly ferruginous-pubescent beneath; 5 to 13 in. long, 3 to 7 in. broad; midrib stout, impressed above, prominent beneath, mainnerves 12 to 20 pairs, 5 to 8 in. apart, starting at an angle of about 55° with the midrib, parallel to near the margin and then curving upwards to join in a marginal nerve; reticulations not prominent, obliquely joining the main-nerves; petiole 1 to 1.5 in. long, thickly rusty-pubescent, channelled above by the decurrent margins of the blade; stipules subulate falcate, 5 in. long, very caducous. Flowers fasciculate, up to 10 together, in the axils of the leaves or of the scars of fallen leaves; pedicels 5 to 7 in. long, rusty-pubescent. Calyx-lobes 6; outer 3 valvate, ovate, densely pubescent, 15 in. long; inner 3 imbricate, orbicular, depressed at top, scarious and ciliate on the margins, 15 in. long. Corolla campanulate; tube short (·1 in.); lobes 6, imbricate, overlapping to the right, ovate-oblong, glabrous, 25 to 35 in. long. Stamens 12, ·25 in. long, opposite to and alternate with corolla-lobes; anthers ovate, apiculate, slightly rusty-hirsute behind; filaments as long as anthers, slender. Ovary rounded; style ·2 to ·4 in. long, subulate; cells 6. Fruit a shining, green, fleshy berry, about 5 in. long, supported by the persistent calyx. Seeds 2, oblong; testa dark brown, crustaceous; albumen none. Dichopsis Maingayi, Clarke in Hook. f. Fl. Br. Ind. III. 543.

Perak: Wray 524, 553, 2215, up to 2,000 feet; King's Collector 6644.

Malacca: Maingay (K.D.) 996/2; Hervey.

- P. Ottolanderi, Koord. & Val. of Java is near this species, but is readily distinguished by its larger flowers and long pointed fruit.
- 3. Palaquium Clarkeanum, King & Gamble. A large tree, with thick rough bark and spreading branches, reaching 100 to 150 feet in

height and 2 to 4 feet in diam. of stem; branchlets stout, uppermost ·5 in. in diam., prominently pitted with the scars of fallen leaves, densely ferruginous-tomentose. Leaves chartaceous; obovate, obtuse at apex, cuneate at base; glabrous above except on the midrib which is strongly pubescent, densely ferruginous-tomentose beneath; margins recurved; 8 to 10 in. long, 4 to 5 in. broad; midrib very thick; main-nerves 18 to 22 pairs, rather irregular, starting at about 70° to 80° with the midrib, straight at first then arching at and along the margin, impressed above; reticulations obliquely transverse, prominent; petiole ·7 to 1 in. long, thick, densely ferruginous-tomentose, enlarged at base. Flowers not seen. Fruit an oblong, glossy, bright green berry, 2 in. long, 1-seeded. Seed oblong, acute at both ends, rounded on the back, flattened at the hilum, 1·2 in. long, ·5 in. broad; testa thin, chartaceous, shining, chestnut-brown; hilum oblong; cotyledons oblong, fleshy. Dichopsis Clarkeana, Brace MS. in Herb. Calc.

Perak: at Waterfall Hill, 600 feet, Wray 530; on open hills near Larút at 500 to 1,000 feet, King's Collector 3796.

Wray says the gutta it gives is not enough in quantity to be worth extraction. The tree is evidently closely allied to *P. Maingayi*, and might almost be made a variety of that species.

4. PALAQUIUM GUTTA, Burck in Ann. Jard. Buit. V. 24, t. IV. (1885). A large evergreen tree; branchlets rough, prominently marked with the scars of fallen leaves and with longitudinal wrinkles; innovations minutely ferruginous-pubescent. Leaves coriaceous; obovate or obovate-oblong, abruptly and usually shortly acuminate at apex rarely rounded, cuneate at base; margins slightly recurved; glabrous above, densely appressed-golden-silky-pubescent beneath especially when young, when old glabrescent; 3 to 5 in. long, 1.5 to 2.5 in. broad; midrib prominent, impressed above; main-nerves 24 to 30 pairs, indistinct, starting at rather more than 60° with the midrib, parallel and arching only close to the margin; secondary nerves and reticulations inconspicuous, the latter very oblique; petiole 1 to 1.5 in. long, slender, grooved above, slightly thickened at base, appressed-golden-pubescent. Flowers in fascicles of about 4 to 5, in the axils of the leaves or of the scars of fallen leaves on the previous year's wood; pedicels thick, 1 to 2 in long, somewhat angular, densely golden-pubescent. Calyx-lobes 6; 3 outer valvate, triangularovate, 3 in. long; 3 inner imbricate, rather longer and more acute, golden-pubescent without. Corolla rotate-campanulate; tube shorter than the calyx; lobes 6, ovate, obtuse, imbricate and twisted at first, afterwards spreading, 25 in. long, glabrous. Stamens 12, opposite to

and alternate with the corolla-lobes, inserted at the top of the tube; filaments equal, slender, '1 in. long; anthers shorter than the filaments, ovate, extrorse, the connective produced in a broad point. Ovary sub-globose, slightly pubescent, 6-celled; ovules oblong, one in each cell; style '4 to '5 in. long, filiform; stigma obtuse. Fruit a 1-2-seeded berry, '6 to '7 in. in diam., ovoid, acute at top; pulp very glutinous, hard. Seeds oblong, rounded at the ends; hilum very large, elliptic, occupying about one-half of the surface; testa shining. Pierre in Bull. Soc. Linn. Par. I. 498; Engl. & Prantl Pflanzenfam. IV. i. 135, fig. 71; Baill. Hist. des Pl. XI. fig. 296. Dichopsis Gutta, Benth. in Gen. Pl. II. 658; Clarke in Hook. f. Fl. Br. Ind. III. 543. Isonandra Gutta, Hook. Lond. Journ. Bot. VI. 463 t. 16; Walp. Ann. i. 496; Miq. Fl. Ind. Bat. II. 1038 t. XXXVI.; Bentl. & Trim. Med. Pl. t. 167.

Penang: Curtis 780, 3535, 3582, 3633, 3635. Perak: Wray 522. Malacca: Maingay (K.D.) 983. Dindings: Hallifax (Curtis 3639). Singapore: Lobb 290; Ridley 9519, 11320.

The true guttapercha tree, perhaps the most valuable of all the trees of the Peninsula. It gives the "Taban" Gutta or "Taban Merah." It has become very scarce in a wild state, but is now being much planted, so perhaps it may soon again become common (see also H. C. Hill, Reports on Forest Conservancy in the Straits Settlements and the Federated Malay States, and Burn-Murdoch in "Indian Forester," XXXI. 309, "Some Facts about Gutta Percha.") Ridley, in Trans. Linn. Soc. III. (1893), 317, says the tree was seen by him in several places in the Tahan woods, and that a considerable amount of guttapercha is collected there.

Var. oblongifolia. A large tree; stem reaching 80 feet in height and up to 2 feet in diam. Leaves larger than in the typical form, obovate-oblong or lanceolate-oblong; longer, abruptly acuminate, reaching 7 in. in length and 3 in. in breadth, rather more conspicuously golden-pubescent. Flowers similar but a little larger, pedicels a little shorter. Fruit rather larger, less acute at top. P. oblongifolium, Burck in Ann. Jard. Bot. Buit. V. 25 tab. V. Isonandra Gutta var. oblongifolia, de Vriese, Tuinbouw Flora (1856), III. 226. Isonandra Gutta, var. β. sumatrana, Miq. Fl. Ind. Bat. II. 1038, and Suppl. 581.

PERAK: Curtis 3637, 3725; Wray 535; Murton; King's Collector 6475. Johore: Curtis 3632—in open forest in the hills at 500 to 1,000 feet.—Distrib. Sumatra, Borneo. Gives guttapercha like the type.

We are unable to find sufficient characters for separating this, as a species, from P. Gutta, as is done by Burck. The specimens available seem to point to a regular series of intermediates, so that it can scarcely be even maintained as a variety. It is possible that P. malaccense and P. formosum, Pierre in Bull. Soc. Linn. Par. I. 498, are both forms of P. Gutta, but we have seen no specimens. Beccari in "Nelle

Foreste di Borneo," p. 558, suggests the identity of the latter species with P-oblongifolium.

5. PALAQUIUM OXLEYANUM, Pierre in Bull. Soc. Linn. Par. I. 498 (1885), non Burck. A large tree; branchlets dark brown, marked by prominent scars of fallen leaves; innovations minutely ferruginouspubescent. Leaves coriaceous; oblong-obovate, abruptly and shortly acuminate at apex, cuneately attenuate at base; glabrous above, densely appressed-golden-pubescent beneath, finally glabrate, margins recurved; 5 to 8 in. long, 2.5 to 3 in. broad; midrib prominent, thick, impressed above; main-nerves 14 to 18 pairs, irregular, sometimes branched, 4 to ·5 in apart, starting at an angle of about 60° with the midrib, curved near the margin to meet in a rather faint looped intramarginal nerve; secondary nerves few; reticulations few, horizontally transverse; petiole 1 to 1.5 in. long, somewhat thickened at base, minutely rustypubescent, channelled above and bordered for some distance by the decurrent margins of the blade; stipules minute, falcate, caducous. Calux-lobes 6: 3 outer rather thicker than 3 inner, ovate, sub-acute, densely ferruginous-pubescent, 25 in. long. Fruit a nearly globose berry, 1 in. long and about .75 in. in diam. Seeds oblong; testa shining, crustaceous. Dichopsis pustulata, Hemsl. in Herb. Kew.

Penang: Curtis 3582. Perak: Curtis 3631, 3638, 3724—on the hills up to 2,500 feet; Wray 511 (part), 590; Douglas; Phillips. Selangor: Curtis 3763, 3764. Singapore: Maingay (K.D.) 983 (the No. 1948 quoted by Pierre); Jas. Collins (a pustulate form apparently diseased).

This species gives apparently the "taban sutra" or "taban putih" guttapercha, which is not one of the best quality.

Var. glabrata King & Gamble. Leaves smaller, about 1.5 in. broad, glabrate beneath, rarely slightly golden-pubescent; fruit oblong; branchlets grey, very rough with scars of fallen leaves and flowers.

Perak: Wray 511 (part), 518.

- P. Oxleyanum, Burck Ann. Jard. Buit. v. (1886) 33, is a different plant altogether (see Teysmann's specimen in Herb. Kew).
- 6. Palaquium xanthochymum, Pierre ex Burck in Ann. Jard. Buit. V. 30 (1885). A large handsome tree; the stem reaching 80 to 120 feet in height and 2.5 to 3 feet in diam.; branchlets dark brown, innovations rusty-pubescent; leaf-bud scales lanceolate, ciliate, about 1 in. long. Leaves coriaceous, glossy-green; obovate, obtuse and often emarginate at apex, cuneate at base; glabrous on both surfaces, margin recurved, reddish when dry; 2.5 to 4 in. long, 1.5 in. broad; midrib prominent,

impressed above; main-nerves obscure, about 12 to 14 pairs at about 60° with the midrib; reticulations scarcely visible; petiole ·5 to ·6 in. long, channelled above by the decurrent margins of the blade; stipules ovate, ciliate, very small, caducous. Flowers fascicled, up to 8 together, in the axils of the leaves or of the scars below them; pedicels slender, recurved, ·2 in. long; buds very small, conical. Calyx-lobes 6, ·1 in. long; 3 outer valvate, 3 inner imbricate, ovate-acute, rusty-pubescent. Corolla campanulate, ·3 in. long, tube short; lobes 6, imbricate, oblong, blunt. Stamens 12, inserted on the top of the tube; filaments stout, curved; anthers ovate-sagittate, mucronate, extrorse. Ovary rounded, glabrous; style ·1 in. long, subulate. Fruit an ovoid berry, glabrous. Isonandra xanthochyma, de Vriese Nat. Tijdschr. Ned. Ind. XXI. 311, and Miq. Journ. Bot. Neerl. i. 259. Dichopsis rubens, Clarke in Hook. f. Fl. Br. Ind. III. 543.

PERAK: King's Collector 7288—on low ground and rich soil.

MALACCA: Maingay (K.D.) 995. SINGAPORE: Cantley 63; Ridley 3774.

—DISTRIB. Borneo.

Produces a guttapercha of a yellowish colour and second quality (de Vriese).

7. PALAQUIUM BANCANUM, Burck in Ann. Jard. Buit. V. 43 (1885). A very large evergreen tree; stems reaching 80 to 100 feet (Curtis), 100 to 120 feet (Kunstler) in height, with a girth of 10 to 12 feet; branchlets rough, prominently marked with the scars of fallen leaves, upper branchlets and innovations slightly but minutely rusty-pubescent. Leaves coriaceous; clustered at the ends of the branchlets, obovate or oboyate-oblong, abruptly and very shortly acute at the otherwise rounded apex, cuneate at base; margins slightly recurved; glabrous on both surfaces, the lower with very minute glandular scales; 3 to 4 in. long, 1.5 to 2.5 in. broad; midrib prominent, impressed above; main-nerves very obscure, about 14 to 16 pairs, inclined at nearly 70° to midrib and at first parallel, afterwards arching, reticulations very faint; petiole .7 to 1 in. long, edged above with the decurrent margins of the blade, glabrous. Flowers fasciculate, clustered about 2 to 4 together in the axils of the leaves or of the scars of fallen leaves, often on a length of as much as 4 to 5 in. of the branchlet; pedicels and calyx minutely ferruginous-pubescent; pedicels 1 to 15 in. long, thick. Calyx-lobes 6, the 3 outer valvate rounded, the 3 inner imbricate acute, 15 to 2 in. long. Corolla campanulate, tube as long as calyx; lobes 6, ovate, spreading, as long as tube, glabrous except a slight rusty pubescence within. Stamens 12, the 6 longer opposite to, the 6 shorter alternate with, the corolla-lobes; filaments inserted on the top of the tube, slender; anthers ovate, apiculate, extrorse. Ovary flattenedcylindrical, the top rusty-hirsute; style as long as corolla, subulate, glabrous; cells 6. *Fruit* a fleshy oblong or obovate berry, smooth, 75 in. long, 5 in. thick, 1-seeded.

Penang: Curtis 3583, 3659. Perak: Wray 3984; King's Collector 6506, 6509. Singapore: Ridley 6019, 6134, 6502, 6507; Fox 11307 at Bukit Timah; Cantley 73.—Distrib. Bangka.

Said to give a kind of "guttapercha."

8. Palaquium Ridleyi, King & Gamble, n. sp. A tree (?); branchlets blackish-grey, rough, innovations minutely rusty-pubescent. Leaves chartaceous-coriaceous; elliptic or elliptic-obovate, obtuse, emarginate or slightly acute at apex, cuneate at base; glabrous on both surfaces, margins slightly recurved; 2 to 3 in. long, 1 to 2 in. broad; midrib broad; main-nerves 8 to 10 pairs, starting at an angle of about 50° with the midrib, curving upwards to and along the margin, 2 to 3 in. apart; reticulations many, transverse, impressed above; petiole 5 to 7 in. long flattened and bordered by the decurrent broad margins of the blade; stipules small, ovate, hirsute, caducous. Flowers small, fascicled in groups of 6 or 7 together in the axils of the uppermost leaves; pedicels rather thick, about 25 in. long, sparsely appressed-pubescent. Calyx-lobes 6, 1 in. long; 3 outer rounded, shortly mucronate, glabrous, wrinkled when dry; 3 inner thin, scarious on the margins, ciliate, rustypubescent on both sides. Corolla tubular-campanulate, 15 in. long, glabrous; lobes 6, oblong, obtuse, erose at tip; tube as long as lobes. Stamens 12, inserted on the top of the tube opposite to and alternate with the lobes; filaments slender as long as the lobes; anthers ovate-acute. Ovary conical, glabrous below, villous above, surmounted by a conical thick style, 05 in. long, 6-celled. Fruit not seen.

SINGAPORE: Ridley 3591A.

9. Palaquium microphyllum, King & Gamble, n. sp. A tree (?); branchlets rounded, rough, dotted with scars of fallen leaves and flowers; innovations dark ferruginous-pubescent. Leaves coriaceous; obovate, obtuse or slightly obtusely-acute at apex, cuneate at base; glabrous on both surfaces, margins recurved; 1 to 2 in. long, ·7 to 1 in. broad; midrib slender, impressed above; main-nerves indistinct, about 8 to 10 pairs, nearly at right angles to the midrib; reticulations very faint even when dry; petiole ·4 to ·5 in. long, bordered above by the decurrent margins of the blade. Flowers fascicled, 1 to 3 together, above the scars of fallen leaves on the past year's wood; pedicels ·2 in. long, rusty-pubescent. Calyx-lobes 6; outer 3 valvate, ovate-acute, ·15 to ·2 in. long, densely tawny-pubescent; inner 3 imbricate, ovate,

blunt, scarious and ciliate on the margins, tawny-pubescent on the back, ·1 to ·15 in. long. Corolla tubular-rotate; the tube very short, scarcely ·05 in. long; the 6 lobes oblong or nearly spathulate, ·1 to ·15 in. long, reflexed in flower, sparsely hairy without. Stamens 12, filaments slender, recurved; anthers ovate, ·075 in. long, bi-mucronate. Ovary tawny-villous, conical; style ·15 to ·2 in. long, straight; cells 6. Fruit not seen.

SINGAPORE: at Bukit Timah, Ridley 10840.

10. Palaquium hexandrum, King & Gamble. A tree; branchlets light brown, innovations ferruginous-pubescent. Leaves chartaceous, glabrous; elliptic-oblong, shortly and bluntly acute at apex, attenuate and more or less unequal at base; 4 to 5 in. long, 2 to 2.5 in. broad; midrib thick, prominent; main-nerves 10 to 13 pairs, starting at about 65° to midrib then arched upwards, reticulations obscure. Flowers fasciculate, 3 to 4 together in the axils of the leaves or the scars of fallen leaves; pedicels slender, '4 in. long, minutely pubescent. Calyxlobes 6; 3 outer valvate, 3 inner more or less imbricate, pubescent outside, ciliate, ·05 to ·07 in. long, apex scarcely acute. Corolla campanulate; tube 1 in. with a ring of hairs near the mouth inside; lobes 6, imbricate, 15 in. long, oblong obtuse, spreading. Stamens 12, inserted on the top of the tube, 6 opposite to and 6 alternate with the lobes, the alternate ones shorter; filaments slender; anthers exsert, ovatelanceolate, bi-mucronate, as long as filaments. Ovary rounded, thickly rusty-pubescent; style subulate, 25 in. long. Fruit a fleshy berry, about .75 in. in diam., smooth, 1-seeded. Seed ovoid, .7 in. long, .5 in. broad, scarcely flattened; testa thin, brown, shining; hilum very large, occupying about one-half of the seed; albumen none. Dichopsis hexandra, Clarke in Hook. f. Fl. Br. Ind. iii. 543. Isonandra hexandra, Griff. Notul. IV. 292. Payena Griffithii, Kurz For. Fl. II. 121, and Journ. As. Soc. Beng. XLVI. ii. 230 (fide Clarke, but with doubt).

Malacca: Griffith (K.D.) 3609; Maingay (K.D.) 984. SINGAPORE: Ridley 11373.—DISTRIB. Burma (?)

11. Palaquium Herveyi, King & Gamble, n. sp. A large tree; branchlets rather stout, dark brown; innovations minutely rusty-pubescent; leaf-bud scales lanceolate, 15 in. Leaves chartaceo-coriaceous; elliptic or elliptic-obovate, very shortly acute or sometimes emarginate at apex, cuneately attenuate often unequally at base; glabrous above except on midrib and nerves, sparsely rusty-pubescent beneath, afterwards glabrate, cinereous when dry; 2 to 3.5 in. long, 1.25 to 1.75 in. broad; midrib prominent; main-nerves 5 to 7 pairs at about 45° with the midrib and arching upwards, reticulations obscure; petiole 5 in. long

bordered above by the decurrent margins of the blade, rusty-pubescent. Flowers small, fascicled 4 to 6 together in the axils of the leaves or on tubercles above the scars of fallen leaves; pedicels ·3 in. long, slender, decurved, pubescent; buds very small, globose. Calyx 6-lobed, 3 outer valvate, and 3 inner imbricate, ·1 in. long, lobes ovate acute, pubescent. Corolla campanulate; tube short, rusty-hirsute without; lobes 6, oblong-linear, recurved in flower, hairy within at the base, ·15 in. long, imbricate. Stamens 12; filaments long, exsert; anthers ovate, mucronate, extrorse, as long as filaments, hirsute. Ovary subglobose, rusty-pubescent, 6-celled; style slender, ·3 in. long; stigma capitate. Fruit not seen.

Perak: Wray 1104. Malacca: Maingay (K.D.) 995; Scortechini

1892; Hervey. Vern. "Jongek" (Hervey).

Wray says the gutta is sticky and worthless.

12. PALAQUIUM STELLATUM, King & Gamble. A large tree, stems reaching over 100 feet in height; branchlets rather thick, dark brown, rough with the scars of fallen leaves; innovations ferruginous-pubescent. Leaves membrano-chartaceous, clustered at the ends of the branchlets; oblong-lanceolate, shortly acuminate at apex, cuneate at base; nearly glabrous above, pale and when young tomentose beneath, rustystellate-tomentose (Scortechini) on the nerves on both sides; 3 to 6 in. long, 1 to 1.5 in. broad; midrib prominent; main-nerves 10 pairs, starting at about 60° with the midrib and at once curving upwards; reticulations prominent on both sides in an elegant network; petiole ·75 to 1 in. long, slender, densely rusty-pubescent. Flowers fasciculate, 3 to 5 together in the axils of the upper leaves, forming almost a terminal leafy corymb of about 20 to 25 flowers; pedicels slender, about 1 in. long, densely rusty-pubescent. Calyx-lobes 6, densely rusty-pubescent, in 2 series; the outer of 3 valvate, ovate, rounded lobes, the inner of 3 ovate ciliate lobes with scarious margins; both .25 to 3 in. long. Corolla campanulate, 3 to 4 in. long, the tube a little shorter than the lobes; the lobes imbricate, twisted in bud, rounded at top, glabrous. Stamens 12 in one series; filaments on the base of the tube and attached to it, free above, 2 in. long, thickened below, slender above; anthers oblong-lanceolate, apiculate, extrorse, ·1 in. long, glabrous. Ovary rusty-pubescent, sub-globose; style slender, 35 in. long; cells 6 (?). Fruit not seen. Dichopsis stellata, Scortechini MS. in Herb. Calc.

Perak: Scortechini, 1855.

A very distinct species, looking very like a Bassia. Scortechini says it yields good gutta, but in small quantities.

8. Mimusops, Linn.

Trees with milky juice. Leaves chartaceous or coriaceous, with many usually inconspicuous parallel main-nerves. Flowers solitary or fascicled in the axils of the upper leaves on the branchlets. Calyx-lobes 6 or 8, in 2 series, the outer valvate enclosing the inner imbricate. Corolla with short tube; lobes 18 or 24 or more in 2 rows, one-third of the number in the inner, the rest in the outer, row; lobes of the outer row often divided.* Stamens 6 or 8, attached to the corolla-tube opposite the inner lobes; filaments short, dilated, free or connate in a tube with the staminodes; anthers lanceolate, extrorse, usually apiculate by the production of the connective. Staminodes alternate with and as many as the stamens, sub-petaloid, usually fimbriate. Ovary hirsute, 6-8-celled. Fruit a globose or ovate fleshy berry, epicarp crustaceous; seeds few or solitary. Seeds ovate or oblong, often oblique, slightly compressed; hilum basal or lateral; testa hard, shining; albumen fleshy, thin; cotyledons flat, leafy.—DISTRIB. Species about 30; in the tropics of both hemispheres.

Calyx-segments 8; stamens 8; staminodes acuminate, hairy ... 1. M. Elengi.
Calyx-segments 6; stamens 6; staminodes fimbriate, glabrous ... 2. M. Kauki.

1. Mimusops Elengi, Linn. Sp. Pl. 349 (1753). An evergreen tree, stems reaching 40 to 50 feet in height, and with a large girth; ultimate branchlets with dark brown rusty pubescence. Leaves chartaceous; elliptic, shortly acuminate at apex, rounded (often unequally), at base; glabrous on both surfaces, shining above; margins slightly recurved; 3 to 5 in. long, 1.5 to 2.5 in. broad; midrib prominent, raised on both surfaces; main-nerves numerous, the first pair from the base forming intramarginal nerves, which are looped where they meet the 14 to 16 pairs of main-nerves; secondary nerves like the main-nerves and, with the reticulations, forming an elegant network; petiole 6 to 1 in. long, slender; stipules triangular-subulate, very small, ferruginous-pubescent, very caducous. Flowers white, fragrant, solitary or in fascicles of 2 to 6 in the axils of the upper leaves; pedicels 3 to 7 in. long, often deflexed, appressed-ferruginous-pubescent; buds ovoid, acute. Calyx-lobes 8, 3 in. long, ovate-lanceolate, acuminate; the 4 outer valvate, broader than the 4 inner imbricate and channelled on the back; all rusty-pubescent without, glabrous within. Corolla with a very short tube, scarcely over 05 in. long; lobes 24, in 2 rows, the 16 outer linear-lanceolate, the 8 inner rather broader and shorter, linear-oblong. Stamens 8,

^{*} The outer corolla-lobes are now usually considered to be of the character of stipules to the inner row which constitute the regular petals.

opposite the lobes of the inner row; filaments slender, '05 in. long; anthers oblong, glabrous, apiculate. Staminodes alternate with the anthers, oblong-lanceolate, acuminate, toothed, clothed on the back and sides with pale stiff hairs. Ovary silky-pubescent, 6-celled; style slender, grooved, as long as corolla. Fruit an ovoid berry about 1 in. long; yellow when ripe, 1- rarely 2-seeded. Seed oblong, .75 in. long, .5 broad and about 25 thick, rounded above, hollowed at base where is the small oval hilum; testa crustaceous, dark brown, shining; albumen thin; cotyledons oblong, leafy, nearly as large as the seed cavity; radicle inferior. Roxb. Cor. Pl. I. 15. t. 14, and Fl. Ind. II. 236; Gaertn. f. Fruct. I. 198, t. 42; Lamk. Ill. t. 300; Baillon Hist. Pl. XI. 267, figs. 302-309; Engl. & Prantl Pflanzenfam. IV. i. 152, fig. 82 E-J; Burck Ann. Jard. Buit. V. (1886) 61; Wall. Cat. 4146; A. DC. Prod. VIII. 202; Clarke in Hook. f. Fl. Br. Ind. III. 548; Dalz. & Gibs. Bomb. Fl. 140; Wight Ic. t. 1586; Brandis For. Fl. 293; Bedd. Fl. Sylv. t. 40; Kurz in Journ. As. Soc. Beng. XLVI. ii. 231, For. Fl. II. 123; Trimen Fl. Ceyl. III. 86; Prain Beng. Pl. 649; Cooke Fl. Bomb. II. 95. M. obtusifolia, Bl. Bijdr. 672. "Elengi" Rheede Hort. Mal. I. 33 t. 20. Rumph. Herb. Amb. II. 189 t. 63.

PERAK: Scortechini 1122. MALACCA: Griffith (K.D.) 3612; Maingay (K.D.) 995/2, 998; Cuming 2265.—Distrib. India, Ceylon, Burma, cultivated in other tropical regions; the fallen corollas are used to make garlands.

2. Mimusops Kauki, Linn. Sp. Pl. 349 (1753). A large evergreen tree; branchlets thick greyish-brown, extremities somewhat ferruginousscaly or -pubescent. Leaves coriaceous, clustered towards the ends of the branchlets; obovate or elliptic-obovate, obtuse, emarginate or very slightly acute at apex, cuneate at base; glabrous above, densely and smoothly grey-silky-pubescent beneath; the margins slightly recurved; 2 to 4 in. long, 1.25 to 2.75 in. broad; midrib prominent; main-nerves very indistinct, about 14 to 16 pairs, parallel, meeting near the edge in a looped intramarginal nerve; petiole 5 to 1.5 in. long, moderately thick, channelled above. Flowers thickly clustered towards the ends of the branchlets; pedicels .75 to 1 in. long, appressed grey-silkypubescent, angular. Calyx-lobes 6, 25 in. long; 3 outer valvate, ovate, acute, grey-silky-pubescent; 3 inner imbricate, similar but rather thinner. Corolla with a very short tube and 18 (or more, exceptionally) lobes in 2 rows; the outer row 12, lanceolate, acute; the inner 6, spathulate; all 1 in. long or nearly so, glabrous. Stamens 6 to 8. usually 6, extrorse; filaments 1 in. long, conical, glabrous; anthers -1 in. long, linear, blunt. Staminodes alternating with the stamens, ·2 to ·25 in. long, cuneate, deeply and irregularly fimbriate at apex. Ovary villous, ovoid, 6-celled; ovules elliptic; style exsert, 4 in. long, slender. Fruit an ovoid rough berry, 1 in. long, 2-4-seeded. Seeds obliquely obovoid, somewhat curved near the base, 6 to 7 in. long by 4 to 5 in. broad and 4 in. thick; hilum lateral towards the base, 35 in. long, linear-oblong; testa thick, crustaceous, chestnut-brown; albumen thin; cotyledons flat, leafy, oblong, 3 to 35 in. long; radicle inferior, rather large. Wall. Cat. 4149E (upper half); A. DC. Prod. VIII. 203; Clarke in Hook. f. Fl. Br. Ind. III. 549; Miq. Fl. Ind. Bat. II. 1042; Koord. & Val. Bijdr. I. 156; Burck in Ann. Jard. Buit. V. (1886) 64. M. Balata, Gaertn. f. Fruct. III. 133. M. Balota, Bl. Bijdr. 673. M. Hookeri, A. DC. Prod. VIII. 204. M. Bojeri, A. DC. l.c. 205 (fide Miquel). M. dissecta, R. Br. Prod. 531. M. Browniana, Benth. Fl. Austral. IV. 285.—Rumph. Herb. Amb. iii. 19. t. 8 flor. exc.

PERAK: Scortechini. MALACCA: Griffith (K.D.) 3614; Maingay (K.D.) 987.—DISTRIB. Amherst in Burma, Wallich; Malay Islands; tropical Australia—cultivated elsewhere for its edible fruit.

The following new species from the Andaman Islands seems worthy of description here.

MIMUSOPS ANDAMANENSIS, King & Gamble, n. sp. A tree (?); branchlets slender. grey; innovations, with inflorescence and leaf-petioles, covered with appressed pale tawny tomentum. Leaves coriaceous; elliptic-obovate, shortly acute at apex, cuneate at base; margins recurved; glabrous on both surfaces; 3 to 4 in. long, 2 to 3 in. broad; midrib slender; main-nerves about 15 pairs, parallel, very inconspicuous. secondary nerves similar to main-nerves, less prominent; petiole slender, .75 to 1 in. long, channelled above. Inflorescence of 1-3-flowered sessile umbels in the axils of the upper leaves; pedicels slender, 8 to 1 in. long, angular; buds ovoid-conical, 4 in. long. Calux-lobes 8 in 2 series; outer 4 lanceolate, acuminate, valvate, reflexed when open, 4 to 5 in. long; inner 4 as long, linear-lanceolate, deeply channelled on the back, scarcely imbricate. Corolla-lobes 24, the inner series of 8, oblong-lanceolate. glabrous, obtuse, each bearing behind it two narrow acute, simple or deeply bifid lobes. rather shorter than and narrower than the 8 inner lobes. Stamens 8, opposite the inner corolla-lobes, and shorter than them; filaments slender, slightly hirsute, '075 in. long; anthers linear-sagittate, the connective produced in a long apiculus, often bifid. Staminodes alternate with the stamens and rather shorter than them, densely hirsute. linear-lanceolate, long acuminate, midrib black. Ovary rounded, 8-lobed, pubescent: style subulate, glabrous, stigma minutely cleft; cells 8, each with a narrow central ovule. Fruit unknown.

Hill jungle near Port Mouat, S. Andaman, King's Collector.

In the characters of the corolla-lobes this species seems to be intermediate between *Mimusops* and *Imbricaria*, and, since Engler has recently reduced *Imbricaria* to a section of *Mimusops*, we have no hesitation in describing it under that genus.

Order LXXII. EBENACEÆ.

Shrubs or trees with usually hard wood. Leaves alternate, rarely sub-opposite, entire, usually coriaceous, ex-stipulate. Flowers usually direcious, regular; the females usually (and the males sometimes) solitary; the males (and the females occasionally) in short, usually bracteate, axillary or extra-axillary cymes; pedicels articulated. Calyx inferior, gamosepalous, campanulate or tubular, with 3 to 7 valvate, imbricate or contorted, often accrescent, lobes. Corolla gamopetalous, variously shaped; the lobes 3 to 7, usually contorted, sometimes imbricate or valvate in bud. Stamens in the 3 and 4 flowers in a single series, and as many as the corolla-lobes, or 2- or more-seriate and 2 or more times as many; filaments shorter than the anthers, free or in pairs, or variously connate below; anthers linear, usually with longitudinal dehiscence, the connective often apiculate; in the ? flowers reduced to staminodes with empty or abortive anthers, or absent. Disk none. Carpels in the 3 flowers abortive or absent; in the f or 9 flowers connate into a sessile superior ovary, with 2 to 8 usually more or less united styles; the cells as many as or twice as many as the styles with imperfect septa; ovules twice as many as the styles, anatropous, pendulous from the inner angles of the cells. Fruit a coriaceous or fleshy berry, several- or few-seeded. Seeds pendulous, usually oblong, vertically furrowed; testa thin; albumen copious, uniform or ruminate; embryo axial; radicle superior.—DISTRIB. About 320 species, in the tropics generally.

Flowers often 3-merous; ovary 3- or 6-celled 1. Maba.

Flowers mostly 4-5-merous; ovary 4-5 or 8-10-celled . . . 2. Diospyros.

1. Maba, Forst.

Trees or shrubs; leaves alternate, entire. Flowers diccious (moncecious in M. Maingayi), axillary, shortly pedicellate or in small dense cymes; usually 3-merous, rarely 4- or 5-merous. Calyx 3- to 5-fid or partite, rarely sub-truncate, often cup-shaped and accrescent. Corollatube usually longer than the calyx; lobes of the limb 3, twisted to the right hand. Male flowers: stamens 3 to 21; filaments distinct, in pairs or otherwise united; anthers oblong; ovary rudimentary. Female flowers: staminodes 0 to 12; ovary 3-celled or perfectly or imperfectly 6-celled, 6-ovulate. Fruit ellipsoid or globose, baccate, glabrous or hairy, 1-6-celled and 1-6-seeded, rather dry or fleshy; albumen not ruminate.—Distrib. Species about 70; tropical.

Leaves opposite or almost opposite	1.	31	Hierniana.
Leaves alternate:—			
Leaves puberulous on the lower surface, their veins prominent Leaves densely velvety pubescent on the lower surface, their	2.	M.	venosa
	3.	M.	olivacea.
Leaves broadly ovate or elliptic, 3 to 5 in. long and 1.65 to			
2.65 in. broad; main-nerves 3 to 5 pairs Leaves oblong to oblong-lanceolate 1.5 to 3 in. long and .65 to	4.	M.	merguensis.
1.35 in. broad:—			
Main-nerves 6 or 7 pairs; fruit globular	5.	M.	Clarkeana.
Main-nerves obsolete; fruit obliquely ellipsoid	6.	. M.	perakensis.
Leaves polymorphous (mostly elliptic obovate or sub-rotund);			
fruit globular, fusiform	7.	. M.	buxifolia.

1. Maba Hierniana, King & Gamble, n. sp. A small glabrous shrub; young branches much thinner than a goose-quill, pale, glabrous. Leaves opposite, thinly coriaceous; oblong-elliptic, the apex shortly acuminate, the base cuneate, the edges slightly recurved when dry; both surfaces hepatic-brown when dry and shining, the reticulations on the upper distinct; main-nerves 8 to 10 pairs, curved, ascending and forming wide arches near the edge, prominent on the lower surface, faint on the upper; the midrib bold on both; length 6 to 10 in.; breadth 2 to 3.5 in.; petioles .3 to .6 in. Male flowers unknown. Female flowers rotate, 4 in. across, almost sessile, in axillary or extra-axillary fascicles of 2 or 3. Calyx spreading, divided almost to the base into 3 to 5 rotund, minutely crenate, slightly imbricate lobes. Corolla nearly twice as long as the calyx, deeply divided into 5 broadly oblong blunt lobes with slightly recurved edges; staminodes 3 or 4, with short thick filaments and broad antherodes. Ovary depressed-hemispheric, with short, thick, conical style and small stigma. Fruit not seen.

PERAK: King's Collector 7920.

2. Maba venosa, King & Gamble. A tree 15 to 50 feet high; young branches twice as thick as a crow-quill, the bark pale and deciduously cinereous-puberulous. Leaves alternate, thinly coriaceous; oblong-elliptic, acute or shortly acuminate, the base slightly cuneate or rounded; both surfaces dark olivaceous when dry; the upper shining, glabrous except the puberulous depressed midrib and mainnerves; the reticulations minute but distinct; lower puberulous everywhere and the midrib prominent; main-nerves 6 to 9 pairs, prominent, curved, spreading, interarching boldly near the edge; length 4.5 to 6.5 in.; breadth 2 to 3 in.; petioles 35 to 5 in. Male and female flowers alike, in densely crowded extra-axillary cymose fascicles of 5 or 6, not longer than the petioles; flowers mostly sessile, one or

two in each fascicle on a short densely hairy pedicel, rotate, '3 or '4 in. in diam. Calyx very coriaceous, divided to the base into 3 spreading broadly ovate lobes with broad blunt apices and concave bases, partly adpressed-pilose and partly glabrescent. Corolla smaller and less coriaceous than the calyx, tubular, glabrous, its lobes ovate-elliptic. Male flowers with 6 stamens in 2 rows, 3 of them small; anthers cordate, filaments flat; rudimentary ovary ovoid, apiculate, with a dense ring of coarse hair at its base. Female flowers with a few flat staminodes; the ovary broadly ovoid apiculate, hirsute in its lower part; styles 3, glabrous, distinct, the stigmas broad. Fruit ovoid-globular, glabrous, '75 in. long and '6 in. in diam., blunt at apex and base, the latter subtended by the 3- sometimes 4-lobed, thick, almost woody, accrescent calyx, its lobes spreading, their edges reflexed. Seeds elliptic, plano-convex. Diospyros venosa, Wall. Cat. 4126.

SINGAPORE: Ridley 4961; King's Collector 3495, 3862, 7643.

3. MABA OLIVACEA, King & Gamble, n. sp. A tree 50 to 70 feet high; young branches half as thick as a goose-quill, puberulous, pale cinereous when dry. Leaves coriaceous, alternate; elliptic, shortly and abruptly apiculate, the base rounded or cuneate, the edges much recurved when dry; upper surface olivaceous, shining, glabrous except the depressed rusty-puberulous midrib; lower surface softly velvetypubescent, olivaceous, the hair on the bold midrib and 5 to 8 pairs of curved spreading rather prominent main-nerves rusty; length 3 to 5.5 in.; breadth 1.5 to 2.25 in.; petiole 4 in., tomentose. Male flowers sessile, 15 in. long, in branched condensed axillary and extra-axillary cymes less than 1 in. long; bracteoles broad, blunt, small. Calyx ·1 in. long, tubular-campanulate, tomentose outside, glabrous inside, divided nearly to the base into 4 broadly ovate obtuse erect lobes. Corolla cylindric-campanulate, glabrous except the hairy edges of the 4 oblong lobes. Stamens 8 large and 4 small, lanceolate, on short filaments. Female flowers not seen. Fruit ellipsoid, blunt at each end, the apex crowned by the short style, glabrous, about 5 in. long, and 4 in. in diam. Calyx at the base of the fruit thick, spreading, 6 in. across, with 4 ovate, blunt lobes with reflexed edges.

Perak: King's Collector 7877; Wray 1269. Lankawi: Curtis 1661.

4. Maba merguensis, Hiern in Trans. Camb. Phil. Soc. XII. 134 (1873). A small, nearly glabrous tree; young branches thicker than a crow-quill. Leaves alternate, thinly coriaceous, ovate or elliptic, shortly and obtusely acuminate, the base cuneate or rounded; main-nerves 3 to 5 pairs, slightly curved, ascending; length 3 to 5.5 in.; breadth 1.65 to 2.65 in.; petiole about .25 in. long. Male flowers in dense minutely

pubescent branching axillary cymes only 1 to 1.5 in. in diam. Calyx less than .25 in. long, with 3 or 4 obtuse triangular lobes. Corolla slightly larger than the calyx, shortly 3- or 4-lobed. Stamens 14 to 16, glabrous; rudimentary ovary minute. Female flowers 3- or 4-merous. Calyx lobed half-way down. Corolla 3- or 4-merous; Staminodes 3 or 4. Ovary-cells 6, 1-ovulate. Styles 3, distant, glabrous. Fruit sub-globular; its calyx .5 in. in diam. with 3 ovate acute spreading lobes. Kurz in Journ. As. Soc. XLVI., ii. 232, and For. Fl. II. 139; Clarke in Hook. f. Fl. Br. Ind. III. 552.

Penang: Helfer (K.D.) 3618; Curtis 705, 718.—DISTRIB. Burma. Very imperfectly represented in Herbaria.

5. MABA CLARKEANA, King & Gamble, n. sp. A tree 20 to 30 feet high; young branches twice as thick as a crow-quill, puberulous when young, ultimately glabrous, cinereous with small black striæ. Leaves alternate, coriaceous; oblong, the apex blunt and sometimes minutely notched, the base cuneate; upper surface olivaceous, glabrous, shining when dry; lower surface dull, paler, sparsely and deciduously adpressedpubescent and the minute reticulations rather distinct; main-nerves 6 or 7 pairs, spreading, very faint on both surfaces; midrib bold in the lower, depressed on the upper surface; length 1.5 to 3 in., breadth ·65 to 1·25 in.; petioles ·1 in. long. Male flowers small (only ·1 to ·15 in. long), crowded in sessile cymes 25 to 5 in. long, in the axils of the upper leaves, with a few oblong bracteoles. Calyx sessile or subsessile, adpressed-pubescent outside, glabrous inside, divided half-way down into 3 sub-erect broadly ovate acute lobes. Corolla smaller than the calvx, densely sericeous outside, glabrous inside, divided to the base into 3 ovate-lanceolate, with an inner row of 3 or 6 similar but narrower, lobes. Stamens 6, in pairs, joined by the bases of their broad filaments; anthers lanceolate. Female flower unknown. Fruit globular, 35 in. in diam., glabrous. Calyx at its base thick, with 3 obtuse angles. Seeds 3, 3-sided, 25 in. long.

PERAK: King's Collector 4816.

6. Maba perakensis, King & Gamble, n. sp. A tree 50 to 60 feet high; young branches as thick as a crow-quill, minutely puberulous becoming glabrous, dark-coloured, sub-glaucous. Leaves coriaceous, alternate; rather broadly oblong to oblong-lanceolate, the apex acute, the base broad and rounded or slightly cuneate; both surfaces dark olivaceous, the upper shining, the lower dull; main-nerves obsolete; midrib minutely pubescent, prominent on the lower surface, depressed on the upper; length 2.5 to 3 in., breadth .75 to 1.35 in.; petioles

·15 in. long. Male flowers about ·15 in. long, 8 or 10 together in dense sessile axillary clusters not much exceeding the petioles. Calyx sessile or nearly so, campanulate, slightly pubescent outside, glabrous inside, deeply divided into 3 broadly ovate acute lobes. Corolla tubular; adpressed-sericeous externally, glabrous inside, cut half-way down into 3 ovate acute lobes. Stamens 12, 6 of them united by the bases of their filaments; anthers of all lanceolate apiculate, their bases cordate. Female flower not known. Fruit obliquely ellipsoid, the apex shortly apiculate, glabrous; the calyx at the base sub-ligneous, flat, deeply divided into 3 broad ovate-rotund lobes with reflexed edges and blunt tips. Seeds 2, oblong.

PERAK: Wray 3130; King's Collector 3945, 5519.

7. MABA BUXIFOLIA, Pers. Syn. II. (1807) 606. A bush or small tree; young branches puberulous at first, ultimately glabrous. Leaves small, alternate, coriaceous; varying from elliptic to obovate, the apex sub-acute or obtuse, the base always narrowed; upper surface olivaceous, the lower brown; the midrib bold; reticulations rather distinct on the upper surface only; main-nerves 4 to 6 pairs, spreading, slightly prominent on the upper surface, indistinct on the lower; edges slightly recurved; length 35 to 1 in.; breadth 3 to 6 in.; larger in the varieties; petiole less than 5 in. Flowers solitary, or 2 to 3 in short cymes, 3-merous. Calyx ·1 in. long, campanulate, with short triangular lobes. Corolla campanulate with short triangular lobes. Male flowers: stamens 6 to 12, glabrous; rudimentary ovary hairy. Female flower: stamens none; ovary 3-celled; style at the apex 3-lobed. Fruit globose or ellipsoid, 35 in. long, 1-seeded. Calyx at its base cupular, often very short; albumen equable. Wight Ic. t. 763; A. DC. Prod. VIII. 240; Thwaites Enum. Pl. Ceyl. 183; Trimen Fl. Cevl. III. 89; Hiern in Trans. Camb. Phil. Soc. XII. 116; Kurz For. Fl. II. 139; Clarke in Hook. f. Fl. Br. Ind. III. 551. M. littorea, Br. Prod. 527. M. Cumingiana, M. madagascariensis, M. guineensis, M. Smithiana, A. DC. 1.c. 241. M. neilgherrensis, Wight Ill. t. 148 bis. E. M. Ebenus, Wight Ic. tt. 1288-9 (not of Spreng.). Maba? Wall. Cat. 7461. Ferreola buxifolia, Roxb. Cor. Pl. I. 35, t. 45, and Fl. Ind. III. 790.

Malacca: Maingay (K.D.) 979; Griffith (K.D.) 3641. Langkawi: Curtis 2557. Penang: Curtis 708.—Distrib. Malay Archipelago, Br. India, N. Australia, Philippines, tropical Africa.

A variable species, of which two varieties are recognised by Mr. C. B. Clarke in Hooker's "Flora of British India." Both these have leaves longer than as above described, but neither occurs in our region.

2. DIOSPYROS, Linn.

Trees, rarely shrubs. Leaves alternate or rarely sub-opposite. Flowers dicecious, very rarely polygamous, axillary and short-pedicelled, or in small cymes; the ? often, and the & sometimes, solitary; usually 4- or 5-merous, rarely 3-merous. Calyx usually deeply-lobed, rarely truncate, often in the 2 larger than in the 3 and often accrescent and plicate or auriculate in fruit. Corolla tubular with short deep lobes, or salver-shaped, or campanulate; the lobes contorted to the right in bud. Stamens in the 3 flowers 4 to 64, often 16; their filaments distinct, paired or polyadelphous; anthers linear. rarely short; ovary rudimentary. In the 2 flowers, staminodes 0 to 16; ovary 4-5-celled or imperfectly 8-10-celled; the cells usually with 1, rarely with 2 ovules; styles or stigmas 1 to 4. Fruit a globose, ellipsoid or ovoid-conic, berry, usually subtended by the enlarged (sometimes woody) calyx; flesh pulpy or viscid. Seeds oblong, usually compressed; albumen equable or (rarely) ruminate.—DISTRIB. About 220 species, chiefly in the tropics.

Leaves membranous or thinly coriaceous, glabrous or hairy; ε flowers in small cymes or fascicles, 4–5-merous; stamens usually 8, 12, or 16; flowers sub-solitary; ? calyx longer than that of the ε , not accrescent or but slightly so, in fruit:—

Leaves under 1.5 in. broad:-

its calyx 1 in. in diam.

Leaves under 5 in. long:-Fruit globular, glabrous; stamens 16 .. 1. D. Wrayi. Fruit cylindric or oblong-conical, glabrous; stamens about 16; leaves 1 to 1.4 in. long, and under .65 in. broad .. 3. D. microphylla. Fruit ellipsoid:-Stamens 8:-Fruit puberulous:-Leaves usually under 2.25 in. long, lanceolate or sub-rhomboidal 2. D. subrhomboidea. Leaves usually over 2.25 in. long, elliptic-oblong . . 6. D. Scortechinii. Fruit glabrous; leaves 2.5 to 4.5 in. long .. 5. D. graciliflora. Stamens 12; leaves 3.25 to 5 in. long; fruit glabrous .. 7. D. flavicans. Fruit not known; stamens 12; leaves under 2 in. long ... 4. D. dumosa. Leaves over 5 in. long; fruit ovoid-conic, rusty-setose; stamens 6 to 12 8. D. apiculata. Leaves coriaceous, upper surface glabrous and shining; flowers mostly 4-merous, a few 5-merous; & flowers in small cymes or clusters; calyx deeply lobed, often larger in the 2 and differing in shape from that of the &:-Calyx 4-lobed :-Leaves under 5 in. long :-

.. 9. D. lanceæfolia.

Calyx of a flower densely sericeous-pubescent, lobes reniform; fruit ovoid or sub-globose, rusty villous,

Calyx-margins of ? flower tomentose, lobes broadly ovate; fruit globose, ultimately glabrous, '75 in. long	14	מ	lucida.
Leaves 1.5 to 2.5 in. broad:—		_	
Stamens about 12; main-nerves of leaves 8 to 9 pairs	10.	D.	pachyphylla.
Stamens about 16; main-nerves of leaves 6 to 7 pairs	11.	D.	clavigera.
Stamens 16, in pairs; main-nerves of leaves 5 pairs Leaves usually more than 5 and less than 7.5 in. long:—	13.	D.	styraciformis
Leaves under 6.5 in. long, over 2.5 in. broad; fruit olive- shaped, nearly 2 in. long and 1.25 in. in diam. Leaves under 2.5 in. broad:—	12.	D.	bilocularis.
Leaves under 6.5 in. long; main-nerves of leaves not			
visible, probably many pairs; fruit depressed-globose, 1·35 in. in diam.; persistent calyx thick, woody Leaves under 7·5 in. long; main-nerves 5 to 8 pairs; fruit ellipsoid, 1 in. in diam.; persistent calyx with		D.	oleifolia.
large membranous lobes	27.	D.	paniculata.
Leaves usually more than 6 and less than 12 in. long:—			
Leaves beneath covered with appressed sericeous hair; stamens 20 to 24; main-nerves of leaves not visible	21	ת	araentea.
Leaves beneath glabrous except the midrib, which is covered with dark hair; main-nerves of leaves 7 to 8			ar gontour.
pairs; fruit glabrous	17.	D.	tristis.
Leaves beneath glabrous or only minutely puberulous:—			
Leaves usually 3 to 3.5 in. broad:—			
Main-nerves of leaves 8 to 10 pairs; apex caudate-		1	
acuminate, base cuneate	18.	D.	pauciflora.
Main-nerves of leaves 10 to 12 pairs; apex acute,	10	n	.772
base rounded	19.	υ.	ellipsoidea.
Main-nerves of leaves 8 to 14 pairs; apex sub-acute Main-nerves of leaves 16 to 20 pairs; apex shortly		D.	Horsfieldii.
acuminate		D.	toposioides.
Leaves 3.5 to 4.5 in. broad; main-nerves of leaves 8 to			
12 pairs; apex acute; fruit densely rusty-tomentose,			
ridged	28.	$\mathcal{D}.$	Kunstleri.
Leaves 8 to 14 in. long, 2.5 to 5 in. broad; main-nerves			
14 to 18 pairs; fruit sub-globose, 1 in. in diam., immersed		_	
in the thickened calyx		Д.	waurenn.
14 to 20 pairs; fruit depressed-globose, 2 in. in diam., seated on a cupular calyx		T	viaida
Calyx 5-lobed:—	22.	υ.	1 by but.
Leaves glabrous beneath, 7 to 9 in. long, 3 to 3.75 in.			
broad; main-nerves 16 to 18 pairs	15.	D.	oblonga.
Leaves puberulous on the midrib and main-nerves beneath,			
5.5 to 7.5 in. long, 2.5 to 3.25 in. broad; main-nerves 10			
to 12 pairs	16.	$\mathcal{D}.$	Helferi.
Leaves glabrous beneath, 5.5 to 9 in. long, 1.5 to 2.5 in.			
		D.	brachiata.
Leaves thinly coriaceous, glabrous above, puberulous beneath; both ε and ε flowers in few-flowered cymes, on long, slender, extra-axillary peduncles, pendulous; calyx 5-lobed, not accres-			
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SPECIES IMPERFECTLY KNOWN.

Calyx of fruit long, woody, its lobes pointed and much reflexed,	
leaves glabrous	30. D. reflexa.
Leaves oblong, hairy beneath, cordate at the base. Calyx in fruit	
small. Fruit globular, rusty-pubescent	31. D. penangiana.
Leaves quite glabrous, elliptic, narrowed at each end, not	
cordate. Fruit globular with small calyx	32. D. rufa.
Leaves coriaceous, quite glabrous, oblong, areolar-reticulate.	
Male flowers in terminal tomentose cymes	33. D. areolata.
Leaves membranous, oblong or oblong-elliptic, glabrous. Female	
flowers in fascicles of about 3. Calyx with reniform lobes; pedi-	
cels bi-bracteolate. Corolla salver-shaped	34. D. Curtisii.
Leaves membranous, puberulous beneath. Male flowers in dense	
short hairy glomeruli. Stamens 8	35. D. glomerulata.
Leaves puberulous beneath. Calyx-lobes 4; stamens 16	36. D. caliginosa.

1. DIOSPYROS WRAYI, King & Gamble, n. sp. A shrub 4 to 12 feet high; young branches as thick as a crow-quill, cinereous- or rustypuberulous. Leaves small, alternate, membranous; ovate-lanceolate to narrowly elliptic, shortly acuminate, the base cuneate; both surfaces dark olivaceous; the upper very shining and minutely reticulate, glabrous except the puberulous depressed midrib; the lower more brown and dull, the midrib pubescent and prominent, the reticulations less distinct; length 2 to 4 in., breadth .75 to 1.5 in.; petioles .05 to .1 in. Male flowers 25 in. long, 2 to 4 together in small axillary cymes, black when dry, puberulous, pedicels very short. Calyx less than 1 in. long, narrowly campanulate with 4 deep ovate lobes. Corolla three times as long as the calvx, salver-shaped, sub-glabrous; limb with 4 oblong lobes. Stamens 16, united in pairs by the bases of the unequal filaments, broadly lanceolate, inserted near the base of the tube. Female flowers like the 3 but longer—especially the calyx. Staminodes about 8, lanceolate. Ovary glabrescent, ovoid-conic, tapering into a rather long style; stigmas 4, fleshy, short. Fruit globular, crowned by the short style, glabrous, shining, black when ripe (when dry); calyx at its base '75 in. across, coriaceous, deeply divided into 4 oblong blunt or sub-acute reflexed lobes.

Perak: Scortechini; Wray 2764, 3272, 3955; King's Collector 2076, 2993.

2. Diospyros sub-rhomboidea, King & Gamble, n. sp. A shrub 4 to 6 feet high; young branches thinner than a crow-quill, softly tawny-pubescent, pale brown when dry. Leaves small, alternate; lanceolate or ovate-lanceolate or sub-rhomboidal, bluntly acuminate, the base cuneate; both surfaces olivaceous-brown when dry, the upper dark, glabrous except the puberulous midrib, the lower sparsely adpressed pubescent especially on the bold midrib; main-

nerves 4 or 5 pairs, curved, ascending, faint on both surfaces; length 1.5 to 2.25 in., breadth .6 to .8 in.; petiole about .1 in. Male flower .6 in. long, solitary, axillary on a short tomentose pedicel with 2 broad bracteoles. Calyx less than .1 in. long, pubescent outside, glabrous inside, deeply divided into 4 broad obtuse almost quadrate imbricate lobes. Corolla salver-shaped; the tube cylindric, tapering to the apex, tomentose outside; limb as long as the tube but less hairy outside, glabrous inside like the tube, deeply divided into 4 oblong sub-acute lobes with inflexed edges, twisted to the right in bud. Stamens 8, attached near the bottom of the tube, 4 shorter than the others; anthers all lanceolate, and on short filaments. Female flower not known. Fruit ellipsoid, sparsely adpressed-puberulous, crowned by the conic style, .8 or .9 in. long and .4 in. in diam. Calyx at its base .25 in. across, flat, with 4 spreading, broad, blunt lobes.

PERAK: Wray 4055; King's Collector 7302.—DISTRIB. Sumatra, Forbes 2004.

3. DIOSPYROS MICROPHYLLA, Bedd. Ic. Pl. Ind. Or. 27, t. exxxiii. (1874), and Fl. Sylv. Madr. cxlv. A tree 20 to 30 feet high; young branches as thick as a crow-quill or thinner, densely pubescent. Leaves thinly coriaceous, alternate, distichous; ovate-lanceolate, sub-rhomboid, the apex sub-acute, the base cuneate; upper surface dark olivaceousbrown, glabrous except the pubescent depressed midrib; the lower dark brown, puberulous, the midrib pubescent; main-nerves obsolete on both surfaces; length 1 to 1.4 in., breadth .45 to .65 in.; petiole .05; the largest leaves towards the ends of the branches. Male flowers solitary or 3 together in a minute cyme. Calyx 05 long, deeply 4-lobed, tube glabrate. Corolla slightly longer than the calvx with 4 rounded lobes. Stamens about 16. Female flowers 2 in. long, axillary, solitary, pedicellate or in a pair on a short peduncle. Calyx campanulate, deeply divided into 4 sub-rotund imbricate very obtuse lobes, sericeous on the middle outside and on the edges, otherwise glabrous. Corolla salvershaped, somewhat longer than the calvx, deeply cut into 4 unequal rotund lobes, adpressed-puberulous on the back of the lobes, otherwise glabrous. Ovary ovoid, sericeous near the apex and base; style thick, 2-fid; stigmas 4. Ovary 4-celled, ellipsoid, conic, 4-celled, cells 1-ovuled. Fruit cylindric or oblong-conical, dry, glabrous, 1-celled, 1- rarely 2-seeded, 75 to 1 in. long. Clarke in Hook, fil. Fl. Br. Ind. III. 559. D. buxifolia, Hiern in Trans. Camb. Phil, Soc. XII. 218. D. vaccinioides, Wall. Cat. 4130 (in part). Leucoxylum buxifolium, Blume Bijdr. 1169; Miq. Fl. Ind. Bat. II. 1050; Choisy Mem. Ternstr. 43 t. 2.

MALACCA: Griffith (K.D.) 3643; Walker 170; Maingay (K.D.) 966. SINGAPORE: Ridley 6045. Penang: Curtis 1513, 7175. Perak:

Scortechini 2052.—DISTRIB. Andaman Islands, South India, Malay Archipelago.

4. DIOSPYROS DUMOSA, King & Gamble, n. sp. A small tree; young branches as thick as a crow-quill, glabrous, dark-coloured when dry. Leaves small, alternate, membranous; lanceolate, shortly acuminate, the base cuneate; upper surface dark olivaceous when dry, glabrous; lower yellowish, slightly puberulous on the slightly prominent midrib and 4 or 5 pairs of curved ascending nerves; length 1.5 to 2 in.; breadth 5 to 75 in.; petiole 05 in. Male flowers 5 in. long. in small axillary sessile fascicles of 3 or 4. Calyx 25 in. long, deeply divided into 3 or 4 ovate-lanceolate acuminate lobes, concave along the midrib, and with undulate edges, pubescent. Corolla twice as long as the calvx, narrowly tubular, deeply divided into 4 narrow oblong glabrous lobes, the tube pubescent inside and outside. Stamens 12, inserted at its base on unequal slender filaments; anthers broadly lanceolate, much apiculate. Female flowers solitary, axillary, shortly pedicellate, ·4 in. long. Calyx cleft to the base into 4 large broadly ovate reniform bluntly acuminate undulate lobes, sparsely adpressed-pubescent on both surfaces, 25 in. long and as much across. Corolla a little longer but less hairy than the calyx, fleshy, tubular, tetragonous, divided for half its length into 4 narrow oblong lobes. Staminodes 8, linear-lanceolate, apiculate, on slender filaments. Ovary narrowly ellipsoid, tapering to the rather long style, glabrous. Fruit unknown.

PERAK: Wray 3508. Junkseylon (Tongka): Curtis 2907.

5. DIOSPYROS GRACILIFLORA, Hiern in Trans. Camb. Phil. Soc. XII. 191 (1873). A glabrous tree 40 to 50 feet high; young branches less than half as thick as a goose-quill, deciduously puberulous, darkcoloured and striate when dry. Leaves thickly membranous, alternate; rather narrowly elliptic, shortly and bluntly apiculate to caudateacuminate, the base much narrowed and often slightly oblique; both surfaces dull dark olivaceous-brown when dry, glabrous except for some minute hairs on the nerves beneath; main-nerves about 5 pairs, curved, ascending, depressed or obscure on the upper surface, pale and slightly prominent on the lower like the midrib; length 2.5 to 4.5 in., breadth .75 to 1.35; petioles .1 to .2 in. Male flowers .5 in. long, few together, in small axillary cymes about as long as the petioles, sessile, puberulous. Calyx large, two-thirds to one-half the length of the corolla, but much wider, deeply divided into 4 large ovate-rotund undulate semi-erect lobes. Corolla narrowly tubular, one-third to onehalf longer than the calvx; the tube externally with 4 lines of pubescence, otherwise glabrescent; limb with 4 deeply oblong broad blunt glabrous spreading sub-undulate lobes. Stamens 8, in two rows,

4 of them smaller than the other 4; anthers linear-lanceolate, apiculate, the filaments flat, very short; rudimentary ovary small, narrowly ovate, glabrous. Female flowers like the 3 and often mixed with them, but sometimes solitary. Ovary broadly ovoid, with short style, glabrous. Fruit ellipsoid, 1 in long and 75 in in diam., glabrous, crowned by the short remains of the style, and subtended by the calyx with 4 spreading, undulate, sub-glabrous lobes. D. flavicans, Hiern in Trans. Camb. Phil. Soc. XII. 205 (as to female plant partly). D. decipiens, Clarke in Hook. fil. Fl. Br. Ind. III. 563.

Malacca: Maingay (K.D.) 972 (\$\circ\$ only). Perak: Scortechini 181, 198; Wray 1298, 2843, 3214, 4227; King's Collector 884, 3298, 3354, 3366, 3588, 3394, 5173, 6742, 7990, 10463. Penang: Curtis 3041.—Distrib. Java, Beccari 1560.

6. DIOSPYROS SCORTECHINII, King & Gamble, n. sp. A tree 15 to 30 or even 50 feet high; young branches as thick as a crow-quill, tawny-puberulous, angled, pale when dry. Leaves alternate, small, membranous: narrowly elliptic-oblong, acuminate, much narrowed at the base to the short petiole; both surfaces olivaceous-brown when dry, the upper glabrous, the lower often puberulous, especially on the midrib; main-nerves 8 to 12 pairs, spreading, curved, ascending, somewhat distinct on the lower surface, faint on the upper as are the transverse reticulations; length 2 to 4 in., breadth 6 to 1.25 in.; petiole ·1 to ·15 in. Male flowers ·5 in. long, in shortly pedunculate axillary fascicles of 2 or 3, or solitary and pedicellate. Calyx 1 in. long, tomentose outside, glabrous inside, 1 in. long, campanulate, deeply divided into 4 broad almost truncate lobes. Corolla coriaceous, ·3 in. long, glabrous; tube tapering a little to the apex; lobes 4, oblong, sub-acute, spreading. Stamens 8; anthers shortly lanceolate, as long as the filaments. Female flowers longer than the 3, solitary, the pedicel as long as the calyx, tomentose. Ovary ellipsoid, densely pilose; style short, conic; stigmas small, glabrous. Fruit ellipsoid. crowned by the very short style, puberulous. Calyx at its base cupular, 2 in. across, tomentose outside, 75 in. long and 4 in. in diam.

Perak: Curtis 2092; King's Collector 2407, 4126, 5002, 5296, 6356; Scortechini 377; Wray 638.

7. DIOSPYROS FLAVICANS, Hiern in Trans. Camb. Phil. Soc. XII. 205 (1873). A tree 40 to 70 feet high; young branches rather thicker than a crow-quill, cinereous-puberulous becoming glabrous. Leaves alternate, thinly coriaceous; elliptic to oblong-elliptic, apex shortly acuminate, the base cuneate; upper surface when dry olivaceous, glabrous, the lower pale brown, densely puberulous on the stout midrib; main-nerves 5 to

7 pairs, curved, ascending; length 3.25 to 5 in., breadth 1.35 to 2.5 in.; petioles 1 to 15 in. Male flowers 45 in. long, 2 to 6 together, in axillary or extra-axillary bracteate sessile tomentose fascicles. Calyx sub-sessile, campanulate, pubescent outside, glabrous inside; the limb deeply divided into 5 broadly ovate, bluntly acuminate spreading lobes. Corolla salver-shaped; tube slightly inflated and glabrous in the lower half outside, cylindric and pubescent in the upper half, inside glabrous; limb with 4 broadly oblong obtuse glabrescent spreading lobes. Stamens 12, of different lengths, attached in 3 rows in the tube; anthers lanceolate-cordate, apiculate; filaments slender and of varying length; rudimentary ovary none. Female flowers conspicuously bi-bracteate, in cymes like the 3 but shortly pedunculate. Calyx as in the 3 but less deeply Fruit ellipsoid, not much narrowed at the ends, slightly tetragonous, glabrous, .75 in. long and about .35 in. in diam., crowned by the short remains of the style; the calyx clasping its base, about half as long, with 4 deep triangular lobes. Seeds 4, ridged. Clarke in Hook. fil. Fl. Br. Ind. III. 562; Kurz in Journ. As. Soc. Beng. XLVI., ii. 236, For. Fl. II. 135. Guatteria? flavicans, Wall. Cat. 7295. Ebenacea, sp. 2, Griff. Notul. IV. 291.

Malacca: Griffith (K.D.) 454, 3623; Maingay (K.D.) 972 (as to male plant only); Helfer (K.D.) 3639? Penang: Curtis 1602. Selangor: Ridley 10556. Perak: 2058; King's Collector 2480, 3354, 3380, 3774, 6149, 6633, 10007.

8. DIOSPYROS APICULATA, Hiern in Trans. Camb. Philos. Soc. XII. 186 (1873). A shrub or small tree; young branches half as thick as a goose-quill, fulvous-hirsute. Leaves alternate, membranous; oblong or elliptic-oblong, sometimes rather oblanceolate, finely caudateacuminate, slightly narrowed to the rounded or somewhat cuneate base; both surfaces dark olivaceous-brown when dry, transversely reticulate; upper surface sparsely adpressed-pubescent, the midrib and main-nerves pubescent and slightly depressed; lower surface darker, and with many long rather coarse hairs, especially on the prominent midrib and 8 to 10 pairs of slightly curved ascending main-nerves; length 5.5 to 7 in., breadth 1.5 to 2.5 in.; petiole ·1 in., tomentose. Male flowers about 3 together, axillary, sub-sessile, ·35 in. long. Calyx 4- to 5-partite, about ·25 in. long, pubescent, lobes narrowly lanceolate. Corolla tubular, 4-lobed, 4 in. long, the lobes spreading, oval, obtuse. Stamens 6 to 12, unequal, glabrous; anthers linear-oblong, acuminate; filaments often geniculate, dilated and somewhat united at the base, rudimentary ovary small, hairy. Female flowers 1 to 3 together on short axillary, minutely hispid cymes.

Fruit sub-sessile, solitary, ovoid-conic, finely rusty-setose, especially in the upper half, about 1 in long and 5 to 75 in across, apiculate. Seeds about 4, albumen not ruminate. Clarke in Hook. fil. Fl. Br. Ind. III. 553.

MALACCA: Maingay (K.D.) 1514. PERAK: King's Collector 5127, 6770. PENANG: Curtis 1584.

9. DIOSPYROS LANCEÆFOLIA, Roxb. Hort. Beng. 93 (1814). A tree; young branches twice as thick as a crow-quill, adpressed-puberulous, dark brown when dry. Leaves alternate, coriaceous; oblong, lanceolate or oblong-lanceolate, acute or acuminate, the base rounded or cuneate, the edges recurved; both surfaces olivaceous-brown when dry, the upper darker and shining, the lower paler and dull; main-nerves 7 to 9 pairs, spreading, faint on both surfaces; midrib bold on the lower surface, depressed on the upper; length 2 to 3 in.; breadth 65 to 1 in.; petiole ·15 to ·2 in. Male flowers sessile in clusters. Calyx ·15 in. long with 4 ovate tawny-sericeous lobes. Corolla ·35 to ·5 in. long, narrowed upwards, the lobes 15 in. long. Stamens about 16; anthers linear, glabrous or slightly pilose at the base; filaments minutely pilose. Female flowers solitary or in pairs on the branches below the leaves, 5 in. long. Calyx 3 in. long, very coriaceous, densely sericeous-pubescent on both surfaces, deeply divided into 4 erect, broadly reniform, acute lobes. Corolla a little longer than the calyx, densely sericeous-tomentose outside, the tube glabrous inside; lobes of limb 4, oblong, very thick. Staminodes 8, linear compressed. Ovary broadly ovate, acuminate, densely silky; stigmas 4, glabrous. Fruit ovoid or sub-globose, rusty-villous; its calyx 1 in. in diam. with thickened tube and spreading lobes. Roxb. Fl. Ind. II. 537; A. DC. Prod. VIII. 232; Hiern in Trans. Camb. Phil. Soc. XII. 213; Kurz in Journ. As. Soc. XLVI., ii. 236, and For. Fl. II. 136; Clarke in Hook. fil. Fl. Br. Ind. III. 562. D. multiflora, Wall. Cat. 4144; A. DC. 1.c. 231. D. amæna, Wall. Cat. 4139; A. DC. l.c. 231.

SINGAPORE: Ridley 4964. Pahang: Ridley 1601.—DISTRIB. Assam range of hills, Burma, Sumatra.

The chief characters separating this from D. lucida, Wall., are the longer lobes of the calyx of the female flower and the somewhat larger and more hairy fruit. This species is not common within our area, whereas D. lucida is a common tree.

10. DIOSPYROS PACHYPHYLLA, Clarke in Hook. fil. Fl. Br. Ind. III. 568 (1882). A tree; young branches rather thinner than a goose-quill, deciduously puberulous, soon glabrous. *Leaves* coriaceous, alternate; elliptic or oblong, sub-acute, the base rounded; both surfaces when

dry rather pale olivaceous-brown, glabrous; the upper shining, the lower glaucous, dull; main-nerves 8 or 9 pairs, curving upwards, faint on both surfaces midrib bold on the lower surface, depressed on the upper; length 3 to 5 in., breadth 1.5 to 2.5 in.; petiole .25 to .4 in Male flowers in short rusty-pubescent axillary and extra-axillary cymes from .5 to .75 in. long, bracts ovate, .1 in. long. Calyx .15 in. long, campanulate, adpressed rusty-tomentose on both surfaces, cut halfway into 4 broad triangular erect lobes. Corolla tomentose externally (fide C. B. Clarke) nearly .5 in. long, its lobes about .1 in. Stamens about 12; anthers linear, with villous connective and glabrous filaments. Female flowers unknown. Fruit globular, the apex concave and bearing the short remains of the style, .65 in. in diam., minutely rusty adpressed-pubescent, becoming glabrous; the calyx at its base woody, cupular, with 4 broad lobes with reflexed apices. Malacca: Maingay (K.D.) 974. Singapore: Ridley 5644.

This does not agree with *D. undulata*, Wall., of which Hiern, in Trans. Camb. Phil. Soc. XII. 215, makes it a variety. It comes much nearer to, but is smaller in all its parts than, the plant named by us *D. Wallichii*, which was originally issued as *D. macrophylla*, Wall. Cat. 4141.

11. DIOSPYROS CLAVIGERA, Clarke in Hook. fil. Fl. Br. Ind. III. 558 (1882). A tree; all parts glabrous except the minutely pilose-ciliate margin of the calyx. Leaves alternate, coriaceous, elliptic, tapering slightly to each end (sub-rhomboidal); both surfaces warm brown when dry, the upper glabrous, shining, the lower dull; main-nerves 6 or 7 pairs, little curved, ascending, slightly prominent on the lower surface, faint on the upper; length 3·25 to 4·5, breadth 1·5 to 2·15 in.; petioles ·15 to ·2 in. Male flowers 3 to 16 together in small sub-sessile axillary and extra-axillary cymes. Calyx ·15 in. long, deeply divided into 4 obtuse lobes. Corolla (in bud) ·35 in. long, clavate, glabrous outside, the upper part very thick, 4-lobed. Stamens about 16, glabrous; anthers oblong, shortly apiculate. Female flower and fruit unknown. D. Ebenum, Hiern (not of Koenig) in Trans. Camb. Phil. Soc. XII. 208 (in part).

MALACCA: Maingay (K.D.) 971; Griffith (K.D.) 3635. LANGKAWI:

Curtis 3418. SINGAPORE: Maingay 5066.

12. DIOSPYROS BILOCULARIS, Oliver in Hook. Ic. Pl. t. 2336 (1894). A glabrous tree 60 to 80 feet high; young branches about the thickness of a goose-quill, dark purplish when dry and shining, slightly striate. Leaves thickly coriaceous; elliptic, sub-acute, the base slightly cuneate, the edges (when dry) recurved; both surfaces olivaceous when dry, the upper shining, the lower paler and dull; midrib inconspicuous and

slightly channelled on the upper surface, bold on the lower; main-nerves 10 to 12 pairs, slightly curved, spreading, interarching far from the edge, faint on both surfaces; length 5 to 6.5 in., breadth 2.5 to 3.25 in. Male flowers .65 in. long (in bud) on rusty-pubescent pedicels .3 to :4 in. long, in axillary and extra-axillary fascicles of 2 to 4, with a few tomentose bracteoles at their bases. Calyx very coriaceous, 25 in. long and nearly as much in width at the mouth; limb 4-lobed, the lobes very short and broad. Corolla narrowly tubular, 4 in. long, very thick; lobes of limb long, narrowly oblong. Stamens 16; sub-sessile, linear, sub-equal, apiculate; rudimentary ovary none. Female flower; calyx and corolla as in the 3, staminodes none; ovary oblong or oval-ovoid, narrowed at the apex, longer than the calyx, 2-celled; ovules 2 in each cell and pendulous. Fruit oliveshaped, shortly apiculate, 1.5 to 2 in. long and 1 to 1.25 in. in diam. at the middle, yellow when ripe; its pedicel obconic, stout, woody, 4 in. long; calyx in ripe fruit flat, with 4 broad blunt lobes. Seed solitary; pericarp thin, only 3 in. across, albumen large stellately ruminate. Maba Maingayi, Hiern in Trans. Camb. Phil. Soc. XII. 107; Clarke in Hook, fil. Fl. Br. Ind. III. 552.

MALACCA: Maingay (K.D.) 976; Derry 1092. SINGAPORE: Ridley 27, 2755, 4920. Perak: at elevations of 1,500 to 2,000 feet, King's Collector 7383.

13. DIOSPYROS STYRACIFORMIS, King & Gamble, n. sp. A tree (?); young branches rusty-pubescent, slightly thicker than a crow-quill. Leaves thinly coriaceous; elliptic to elliptic-lanceolate, the apex subacute or acute, the base cuneate; upper suface dark olivaceous, shining, glabrous except the depressed midrib; the lower surface dull, paler, with deciduous rufous pubescence, especially on the prominent midrib; main-nerves about 5 pairs, ascending, little curved, slightly prominent on the lower surface only; length 2.5 to 4 in., breadth 1 to 2 in.; petiole 2 to 35 in. Male flowers a few together in short cymes grouped in small axillary clusters. Calyx 2 in. long, narrowly campanulate, densely rusty-tomentose externally like the corolla, the mouth with deep narrowly-triangular teeth. Corolla :5 in. long, narrowly tubular, cut half-way down into 4 oblong blunt lobes. Stamens 16, in pairs, unequal, linear, apiculate; filaments unequal in length; rudimentary ovary none. Female flowers solitary, calyx much longer than in the 3; its 4 lobes thick, broad, reniform, rusty-pubescent. Corolla not known; ovary hairy. Fruit globose with the apex truncate and depressed in the middle, densely but minutely pale rusty-tomentose, 5 in. long and about 65 in. in diam. Calyx at its base deeply cupular with 4 spreading triangular teeth. D. nov. spec., C. B. Clarke in Herb. Kew. D. hirsuta, Linn. fil.,? var., Hiern in Trans. Camb. Phil. Soc. XII. 165.

MALACCA: Maingay (K.D.) 969. SINGAPORE: Ridley 3787.

Ridley's No. 1084, from Bukit Timah, in Singapore, seems to belong to this. The only specimen I have seen is imperfect.

14. DIOSPYROS LUCIDA, Wall. Cat. 4127 (1829). A tree 40 to 50 feet high; young branches from half as thick to as thick as a crow-quill. minutely puberulous, becoming glabrescent, dark-coloured. Leaves alternate, coriaceous; oblong or elliptic-oblong, sub-acute or obtuse, the base rounded or cuneate, sometimes a little oblique; both surfaces when dry pale olivaceous-brown, glabrous; main-nerves 5 to 9 pairs, spreading, curved, faint on the lower surface, slightly depressed on the upper: midrib bold on the lower surface, somewhat depressed on the upper: length 1.25 to 4.5 in., breadth .5 to 1.5 in.; petioles .2 to .4 in. Male flowers sessile, in small fascicles. Calyx nearly 15 in. long, campanulate. with 4 erect broadly triangular lobes, tomentose on both surfaces. Corolla narrowly tubular, more than twice as long as the calyx, tetragonous in bud, sericeous-tomentose outside, the tube glabrous inside; limb deeply divided into 4 narrowly oblong thick lobes. Stamens 12 to 16, in pairs united by their short filaments and face to face; anthers linear, glabrous, minutely apiculate, and on short sericeous filaments; rudimentary ovary linear. Female flowers 1 or 2 together, axillary or extra-axillary, sub-sessile. Calyx longer than in the 3, lobed nearly to the base: lobes broadly ovate, their recurved margins minutely tomentose. Fruit globose, 75 in. or more in diam., sub-truncate and slightly umbonate at the apex, adpressed rusty-pubescent at first, ultimately glabrous, 4-6-seeded; the accrescent calyx at its base woody, cupular, 6 in. across with 4 short broad reflexed lobes; albumen of seed not ruminate. A. DC. Prod. VIII. 233; Clarke in Hook. fil. Fl. Br. Ind. III. 568. D. hirsuta, var. lucida Hiern in Trans. Camb. Phil. Soc. XII. 163(not of Linn. fil.)

Malacca: Griffith (K.D.) 3637; Maingay (K.D.) 970, 973, 977, 3,500; Derry 1439. Perak: Scortechini; Wray 3018, 3056. Penang: Curtis 250, 1602; King's Collector 1050, 1760. Singapore: Ridley 2119, 2749, 3580, 4962, 4963, 6129, 8115, 9212, 9517.

This is probably only a southern form of the Indian species D. lanceæfolia, Roxb.

15. DIOSPYROS OBLONGA, Wall. Cat. 4124 (1829). A tree; young branches thinner than a goose-quill, purplish-brown when dry, glabrous. *Leaves* alternate, coriaceous, glabrous; oblong-elliptic, shortly and abruptly apiculate, the base rounded or slightly cuneate; both surfaces

faintly reticulate, quite glabrous, shining; main-nerves 16 to 18 pairs, spreading, little curved, interarching boldly at a little distance from the edges, prominent on the lower surface, depressed on the upper; midrib very bold on the lower surface, depressed on the upper; length 7 to 9 in., breadth 3 to 3.75 in.; petiole 4 in., very stout. Male flowers about ·5 in. long, salver-shaped, in short axillary cymes, coriaceous, subsessile, 5 in. long. Calyx and corolla everywhere adpressed-tomentose. Calyx shorter than the corolla, campanulate, cleft to near the base into 5 oblong, blunt, sub-erect lobes. Corolla-tube narrow, not constricted at the throat; limb with 5 large broad rotund lobes with recurved edges. Stamens 10, united in pairs by the bases of their filaments, the inner ones smaller, all inserted on the base of the calyx-tube. Female flowers 1 to 5 together, 25 to 3 in. long, with 5 deep ovate-oblong auriculate sub-plicate lobes. Corolla 35 in. long, densely hairy outside, deeply lobed; staminodes 5; ovary 10-celled, rusty-hairy. Fruit sub-globose, sub-truncate at base and apex, glabrous when ripe; the hispid accrescent calyx 75 in. across, its lobes auriculate; albumen of seed not ruminate. A. DC. Prod. VIII. 243; Hiern in Trans. Camb. Phil. Soc. XII. 243; Clarke in Hook. fil. Fl. Br. Ind. III. 569; Miq. Fl. Ind. Bat. II. 1045.

Malacca: Maingay (K.D.) 967. Penang: Curtis 1564, 2487. 3658. Singapore: Ridley 2747, 3031, 6311. Perak: King's Collector 3794, 4924, 7237, 8278.

16. DIOSPYROS HELFERI, Clarke in Hook. fil. Fl. Br. Ind. III. 569 (1882). A tree 20 to 30 feet high; young branches half as thick as a goose-quill, pale puberulous, the bark dark. Leaves alternate, coriaceous; elliptic or elliptic-oblong, sub-acute or obtuse, the base broad or subacute; the upper surface dark olivaceous-brown when dry, glabrous except the depressed puberulous midrib, the reticulations minute but distinct; lower brown, glabrescent but puberulous on the rather stout midrib and nerves; main-nerves 10 to 12 pairs, rather faint, spreading, horizontal, interarching boldly about .25 in. from the edge; length 5.5 to 7.5 in., breadth 2.5 to 3.25 in.; petiole .4 to .5 in., stout, pubescent. Male flowers unknown. Female flowers 5 in. long, axillary, solitary or 2 together, sessile. Calyx coriaceous, densely pubescent inside and out, deeply divided into 5 broadly oblong, sub-acute lobes, accrescent, and becoming concave along the midribs of the lobes. Corolla somewhat longer than the calyx, sericeous externally; the tube short, the limb-lobes deep, broadly oblong, blunt; staminodes few, flat. Ovary broadly ovoid, densely sericeous-tomentose. Fruit ovoid-ellipsoid, nearly 1 in. long, and slightly less in diam., glabrous; the accrescent calyx embracing its base deeply 5-lobed, plicate.

Malacca: Griffith (K.D.) 3632. Kedah: Curtis 2596, 8327?; Ridley 327.

17. DIOSPYROS TRISTIS, King & Gamble, n. sp. A tree 40 to 50 feet high; young branches half as thick as a goose-quill, covered with deciduous almost black tomentum. Leaves alternate, coriaceous; oblong-elliptic, shortly acuminate, the base rounded or cuneate: both surfaces dingy olivaceous-brown when dry, minutely reticulate: upper surface glabrous, shining, the lower dull, the prominent midrib densely clothed with dark hairs; the 7 or 8 pairs of prominent ascending main-nerves and the intermediate spaces with a few similar hairs with bulbous bases; length 6 to 9 in., breadth 2 to 2.75 in.; petioles 4 to 5 in. Male flowers 3 in. long, in short axillary cymes 75 in. long. the branches and pedicels densely dark rusty-tomentose outside. Calux glabrous inside; the mouth with 5 broad short obtuse teeth. Corolla fleshy, glabrous, like the calvx in shape and of about the same length. Stamens 24; anthers lanceolate, shortly appendiculate at the apex, sessile. Female flowers unknown. Fruit depressed-globose, glabrous. shining, nearly 2 in. in diam.; the calyx at its base thick, woody, flat, 1.5 in. across, with 5 spreading triangular lobes.

PERAK: Wray 2190; King's Collector 5521.

18. DIOSPYROS PAUCIFLORA, King & Gamble, n. sp. A glabrous shrub or small tree; young branches rather thinner than a goose-quill, their bark dark and rough. Leaves rather large, alternate, very coriaceous; oblong-lanceolate or -oblanceolate, shortly caudate-acuminate, the base slightly cuneate; upper surface olivaceous, shining, lower ochraceous, dull; main-nerves 8 to 10 pairs, spreading, curved, and interarching boldly 1 or 2 in. from the slightly recurved edge; length 5 to 10 in., breadth 1.75 to 3 in.; petiole .25 to .3 in., corrugated. Male flowers 3 in, long, sessile and in sessile axillary fascicles of from 3 to 6. Calyx .25 in. long, narrowly tubular, somewhat narrowed at base and apex, coriaceous, pale in colour, the mouth with 4 broad triangular short erect lobes, outer surface with a layer of minute adpressed tawny tomentum and scattered over it many black adpressed hairs; the interior paler, pustular, with a few similar scattered hairs and a thick ring of them near the base surrounding the rudimentary ovary and clothing it also. Corolla slightly longer than the calyx, fleshy, widely tubular, divided for half its length into 4 broad obtuse lobes with a broad line of adpressed black hairs along the midrib of each outside, the rest of the outer surface adpressed-sericeous, the interior quite glabrous. Stamens 12, viz., 8 in pairs standing face to face and united by their short filaments, and 4 free; anthers of all linear, densely hairy, on short glabrous filaments. Female flowers not seen.

PERAK: King's Collector 7363, 7749.

19. DIOSPYROS ELLIPSOIDEA, King & Gamble, n. sp. A tree or shrub; young branches somewhat thinner than a goose-quill, deciduously and densely rusty-puberulous. Leaves alternate, thinly coriaceous; oblong to elliptic-oblong, rarely slightly oblanceolate, apex acufe, base rounded; both surfaces when dry olivaceous-brown, the upper glabrous, the midrib sometimes rusty-puberulous, the lower surface darker. minutely puberulous; midrib and 10 to 12 pairs of curved ascending nerves faintly prominent on the lower and depressed on the upper surface; length 6 to 10 in.; breadth 2.25 to 3.5 in.; petioles .25 to ·3 in. Male flowers in dense axillary cymes of 6 to 12, not much longer than the petioles; bracteoles few, broad, densely rusty-tomentose. Calyx sub-sessile, tomentose externally, glabrous internally, divided into 4 sub-rotund blunt lobes. Corolla glabrous, very fleshy towards the apex, with 4 broad deep lobes. Stamens at the base of the tube, broadly ovate, apiculate, filaments flattened. Female flowers in subsessile clusters of 3 or 4. Calyx with 4 rounded lobes, reflexed, coriaceous, and in fruit only 35 in. across. Fruit ellipsoid, glabrous, crowned by the short style and subtended by the reflexed broadly-lobed small calvx, 1 to 1.25 in. long and .8 in. in diam. Seeds few, ellipsoid, apiculate, two of the sides compressed.

Perak: King's Collector 2233, 3250, 7098, 7269, 7320, 7689,

8215; Scortechini 1615.

20. DIOSPYROS WALLICHII, King & Gamble. A tree 30 to 60 feet high; young branches covered with minute coarse hair, the older verrucose. Leaves alternate, coriaceous; oblong or elliptic-oblong, apex acute, base cuneate or rounded; edges slightly recurved; upper surface glabrous and shining, lower paler, minutely pubescent at first but becoming glabrescent, both olivaceous when dry; midrib depressed on the upper surface, bold on the lower; main-nerves 14 to 18 pairs, slightly curved, spreading, prominent on the lower surface, faint on the upper; length 8 to 14 in., breadth 2.5 to 5 in.; petiole .5 to .75 in. Male cymes .5 to .75 in. long, in clusters (often crowded) on the branches, 7-10-flowered; bracteoles broad, blunt, concave, thick like the calyx and corolla, and like them densely rusty-tomentose externally. Calyx ·1 to ·15 in. long, tubular; the mouth with 4 blunt triangular erect teeth; tomentose on both surfaces. Corolla thrice as long as the calvx; narrowly tubular, glabrous inside. Stamens 16, in 2 rows, the inner attached to the outer at the bases of their filaments; all linear; rudimentary ovary small, hairy. Female flower rather larger than the &, but in smaller cymes; the calyx tetragonous and deeply grooved, very fleshy, becoming woody, very large and boldly 4-angled and

grooved in the ripe fruit. Corolla as in the 3, but somewhat longer. Staminodes about 16. Ovary conical densely hairy; stigma glabrous, with 4 deep oblong truncate lobes. Fruit 1 in. in diam., nearly twice as much across the calyx, sub-globose, deeply immersed in the large thickened calyx, its apex truncate-concave; seeds 4 or 5. D. macrophylla, Wall. Cat. 4141 (not of Blume). D. undulata, Wall. A. DC. Prod. VIII. 233; Hiern in Trans. Camb. Phil. Soc. XII. 216 (in part); Kurz in Journ. As. Soc. Beng. XLVI. ii. 23, and For. Fl. II. 135 (in part); Clarke in Hook. fil. Fl. Br. Ind. III. 568.

Penang: Curtis 1085; Ridley 7174. Malacca: Maingay (K.D.), 974; Griffith (K.D.) 3636. Perak: Scortechini 1976; Wray 2535, 2865. King's Collector 2966, 2982, 4058, 6779, 7459, 7619, 10123. Kedak: Curtis 2594. Selangor: Ridley 2748, 8544.

This is the plant issued by Wallich as No. 4141 of his Catalogue under the name D. macrophylla. Being different from the older D. macrophylla of Blume, a new name had to be found for it. This was done by De Candolle, who reduced it, as a variety, to Wallich's D. undulata with the type specimen of which in Wallich's own herbarium it does not agree. De Candolle was followed by Hiern, Kurz, and Clarke; we now restore it to specific rank. The true D. undulata, Wall., is a Burmese species. It is found also in the Andaman Islands, but it has not as yet been collected in Malaya.

21. DIOSPYROS ARGENTEA, Griff. Notul. IV. 288 (1854). A tree 15 to 50 feet high; young branches about as thick as a goose-quill, covered with sub-deciduous yellowish silky hairs. Leaves large, coriaceous; oblong, apex acute, base rather abruptly cuneate or rounded; upper surface warm brown when dry, glabrous and shining, the midrib depressed; lower densely covered with yellowish adpressed sericeous hair, the midrib very stout; main-nerves invisible on both surfaces; length 6 to 10 in.; breadth 1.65 to 3.5 in.; petioles 1 to 25 in. Male flowers in somewhat supra-axillary few-flowered shortly pedunculate spike-like cymes 1 to 1.25 in. long (peduncle included); bracts ovate .2 in. long. Calyx 25 in. long, deeply 4-lobed, villous. Corolla 35 in. long, tubular, lobed half-way down, very villous outside. Stamens 20 to 24. Female flower solitary on a peduncle ·2 in. long; calyx campanulate, ·5 in. long, with ovate lobes. Corolla ·65 in. long. Staminodes 4 to 5. Ovary 4-celled, 8-ovuled, densely hairy; styles 4, erect, hairy. Fruit ellipsoid, apiculate, 2 to 2.5 in. long and 1 to 2 in. in diam., densely rustytomentose; the calyx persistent, its lobes enlarged, broad, very coriaceous, shortly hairy. Hiern in Trans. Camb. Phil. Soc. XII. 262; Clarke in Hook. fil. Fl. Br. Ind. III. 569. D. discolor, Wall. Cat. 4131 (not of Willd.).

Malacca: Griffith (K.D.) 3625; Maingay (K.D.) 968, 970; Goodenough

1301, 1476. SINGAPORE: Ridley 3648, 5898; Hullett 825. PERAK: Wray 172, 1392; King's Collector 4812, 5862, 6387, 6896, 8003, 8142; Scortechini 498. Pangkore: Curtis 1365. Selangor: Ridley. 10271. Pahang: Ridley in Trans. Linn. Soc. Ser. 2, III. 318 in Tahan woods.

22. DIOSPYROS RIGIDA, Hiern in Trans. Camb. Phil. Soc. XII. 257 (1873). A tree 30 to 60 feet high; young branches as thick as a goose-quill, minutely dark rusty-tomentose. Leaves alternate, very coriaceous, large; oblong or elliptic-oblong, equal-sided, the apex sub-acute, the base rounded and neither oblique nor cordate: upper surface dark olivaceous-brown when dry, shining, minutely reticulate; lower paler olivaceous-brown, covered except the midrib with a very thin film of minute tomentum, minutely reticulate; midrib very bold on the lower surface, pubescent at the sides, slightly depressed on the upper; main-nerves 14 to 20 pairs, spreading, interarching 35 in. from the edge, slightly distinct on the lower surface, invisible on the upper; length 10 to 18 in., breadth 2 to 4 in.; petiole ·4 to ·6 in., very stout. Male flowers when in bud ·4 in. long and nearly 3 in. in diam., few, in short extra-axillary cymes, densely covered with black tomentum; the pedicels stout, deflexed, about .75 in. long. Calyx densely tomentose, ovoid, tapered to the apex, its mouth with 4 broad shallow blunt teeth. Corolla (apparently) not much longer than the calyx, very coriaceous, glabrous, the tube ovoid; the lobes short, oblong, blunt. Stamens about 20, inserted at the base of the tube, unequal; anthers lanceolate, apiculate, almost sessile. Female flowers unknown. Ripe fruit in cymes, depressedglobose, glaberulous, with a woody rind, 1.75 in. in length from base to apex and 2 in. in diam.; remains of style none; calyx at base of fruit cupular, 1.5 in, across, divided into 4 reticulate leathery spreading broadly ovate lobes; peduncle '75 to 1.25 in. long, with dark hispid hairs.

PERAK: King's Collector 4024, 5732, 5971, 6801; Wray 3708.— DISTRIB. Borneo.

23. DIOSPYROS HORSFIELDII, Hiern in Trans. Camb. Phil. Soc. XII. 193 (1873). A tree 20 to 40 feet high, all parts except the cymes glabrous; young branches thinner than a goose-quill, pale. Leaves alternate, coriaceous; oblong-elliptic or ovate-oblong, apex sub-acute, base slightly cuneate or rounded, the edges slightly recurved when dry; upper surface when dry olivaceous-green, lower surface brown; the midrib and nerves depressed; the reticulations, midrib, and 8 to 14 pairs of curved spreading main-nerves very bold and prominent; length 6 to 10 in., breadth 2.5 to 4 in.; petioles 35 in. Cymes 2 to 3 in. long,

covered with black pubescence, few-flowered, collected on extra-axillary or axillary tubercles, sometimes forming small panicles, consisting mostly of 3 flowers, and often with only a few 2, with many oblanceolate blunt bracts 25 to 3 in. long, and some smaller bracteoles; branches of the cyme striate when dry. Calyx 15 in. long, divided to its base into 4 broadly ovate undulate lobes. in bud cylindric, tetragonous at the base; about '4 in. long, tomentose, deeply divided into 4 narrowly elliptic blunt lobes. Stamens about 16 in 2 rows, united into a tube, the anterior row smaller than the posterior, all narrow and apiculate, the filaments short and hairy. Female flowers like the 3 as to calyx, but with corolla somewhat longer and with about 12 flat staminodes. Ovary ovoid-conic, tomentose, attenuated into a long style. Stigma with several small lobes; ovary 8-celled. Fruit when ripe ovoid-globular, 1 to 1.25 in. in diam., glabrescent, subtended by the accrescent calvx with large reticulate undulate lobes. Seeds compressed, oblong. Clarke in Hook. fil. Fl. Br. Ind. III. 571. D. frutescens, Hassk. Pl. As. Rar. 467 (not of Blume).

MALACCA: Griffith (K.D.) 3620. Perak: Scortechini 1765; King's Collector 8261.—Distrib. Java.

Specimens of this sent from Herbarium Koordersianum, Buitenzorg, have pentamerous flowers; but in other respects they do not differ from the Perak specimens in Herb. Calcutta.

24. Diospyros toposioides, King & Gamble, n. sp. A glabrous tree 15 to 40 feet high, sometimes only a shrub; young branches rather thinner than a goose-quill, pale brown and striate when dry. Leaves alternate, coriaceous; oblong-elliptic, shortly acuminate or acute, base rounded; edges slightly recurved when dry; both surfaces pale olivaceous when dry, minutely but distinctly reticulate, the upper shining, the lower darker and dull; midrib channelled on the upper surface, strong and prominent on the lower; main-nerves 16 to 20 pairs, spreading, little-curved, interarching far from the edge, the intermediate nerves nearly as prominent; length 7 to 11 in.; breadth 2 to 4 in.; petiole ·3 to ·4 in. long, stout, wrinkled when dry like the midrib. Male flowers 25 in. long, on pedicels longer than themselves, in cymose axillary panicles about 1 in. in length. Calyx coriaceous, glabrous, campanulate, with wide truncate entire or sub-entire mouth. Corolla slightly exceeding the calyx, ovoid, inflated below, contracted to the 4-toothed apex. Stamens numerous, linear, slightly auricled at the base, filaments very short. Female flowers when in bud 3 in. long, conical. Calyx acutely 4-angled in bud; the 4 lobes deltoid, very coriaceous, puberulous outside, rusty-tomentose inside like the ovary and young

fruit, accrescent in fruit. Corolla slightly longer than the calyx, tubular, with 4 short erect ovate lobes, quite glabrous. Staminodes about 12, flattened, villous behind. Ovary conical, densely rusty-tomentose. Stigma glabrous, short, with 8 small lobes. Fruit in cymes, depressed-globular, 1 to 1.25 in. in diam., much exceeding the minutely reticulate calyx, glabrescent, minutely tuberculate. Seeds compressed.

Perak: King's Collector 4106, 4361, 4889, 5769, 8242, 8357;

Scortechini; Ridley 3079, 10302?

The leaves of this in texture and reticulations much resemble those of D. Toposia, Ham. The flowers and inflorescence are, however, different from those of that species.

25. Diospyros oleifolia, Wall. Cat. 4128 (1829). A tree; young branches twice as thick as a crow-quill, almost black when dry, sparsely pubescent. Leaves coriaceous, alternate; narrowly oblong to elliptic, sub-acute or acute, the base cuneate; upper surface pale olivaceous, glabrous, shining; the lower yellowish, dull, for the most part glabrous, but usually with sparse adpressed black detachable hairs near the midrib and base; main-nerves invisible on either surface; midrib strong on the lower surface, slightly depressed on the upper, length 6.5 in.; breadth 2 in.; petiole .25 in. long. Male cymes on axillary peduncles about 3 in. long, each bearing 3 unequally pedicellate flowers 5 in. long; all very dark in colour and with black hairs like those on the outer surface of the calvx. Calvx 4 in. long, tubular-campanulate, densely adpressed rusty-tomentose inside, cut half-way down into 4 triangular erect lobes. Corolla tubular, slightly longer than the calyx, very thick, densely tomentose like the interior of the calyx; its lobes 4, very thick, oblong, spreading slightly. Anthers attached near the base of the tube, 16, linearlanceolate, sessile. Female flowers on longer panicles than the males; pedunculate calyx with 4 triangular acute lobes, velvety outside, tawnytomentose inside. Fruit depressed-globose, 1.35 in. in diam.; the pericarp woody, glabrous when ripe, tawny-tomentose when young, the persistent calyx at its base thick, woody, nearly 1 in. in diam... with dark tomentum outside. A. DC. Prod. VII. 132; Kurz in Journ. As. Soc. Beng. XLI., Pt. II. 72, id. XLVI., Pt. II. 235, and For. Fl. II. 132; Hiern in Trans. Camb. Phil. Soc. XII. 204; Clarke in Hook fil. Fl. Br. Ind. III. 567.

Penang: Curtis 1573. Perak: King's Collector 3876; Scortechini.—Distrib. Burma, Java.

26. Diospyros brachiata, King & Gamble, n. sp. A glabrous tree

20 to 40 feet high; young branches half as thick as a goose-quill. Leaves alternate, coriaceous; elliptic-oblong, acute or shortly acuminate, the base slightly cuneate or rounded; upper surface pale olivaceous when dry, lower pale brown; main-nerves 10 to 12 pairs, curved, ascending, prominent like the midrib on the lower surface, depressed somewhat on the upper; length 5.5 to 9 in.; breadth 1.5 to 2.5 in.; petioles 3 to 5 in. Male flowers about 5 in. long. Calyx 2 in. long. campanulate, divided almost to the base into 5 ovate-acute erect lobes. each folded vertically along the midrib so as to form a deep dorsal groove, everywhere minutely rusty-tomentose. Corolla twice as long as the calvx, narrowly tubular; the tube 5-angled, externally divided, the 5 lobes twice as long as the tube, linear-oblong, contorted in æstivation, the external half of each lobe tawny-tomentose, the inner half and the whole of the anterior surface glabrous. Stamens 14, linear, apiculate, sub-sessile. Female flowers · 4 in. long, collected in compound umbellate axillary cymes 1.5 to 1.75 in. long and about as much across, the branches compressed, rusty-puberulous, spreading, bearing a few oblong obtuse bracts; flower-pedicels varying in length from 1 to 2 in., bibracteolate. Calyx fleshy, tomentose outside, deeply divided into ovate-acuminate erect grooved lobes. Corolla tubular, tomentose outside, glabrous inside, very thick, deeply divided into 4 oblong lobes. Staminodes about 8, lanceolate, flattened. Ovary ovoid, tapering into a short style, tomentose. Fruit depressed-globose, puberulous, .75 to ·9 in diam., and about the same from below the calyx to the somewhat concave apex; calyx woody, thick, 1 in. wide, with triangular deeply grooved sub-acute lobes.

Penang: Curtis 1453, 1454, 10230.

27. DIOSPYROS PANICULATA, Dalz. in Hook. Kew Journ. IV. 109 (1852). A tree 50 to 70 feet high; young branches less than half as thick as a goose-quill, rusty-puberulous. Leaves thinly coriaceous, alternate; elliptic or elliptic-oblong, shortly and bluntly apiculate or acuminate; the base cuneate or rounded; both surfaces pale olivaceous when dry, the reticulations minute and distinct, especially on the glabrous upper surface; main-nerves 5 to 8 pairs, curving upwards and forming arches far from the edge, bold like the midrib on the lower surface and slightly depressed on the upper; lower surface softly pubescent; length 4 to 7.5 in., breadth 1.65 to 2.5 in.; petiole .25, stout, channelled, pubescent. Male and female flowers not seen. Fruit in lax racemoid cymes, ellipsoid, crowned by the small remains of the style, rufoushirsute when young, ultimately glabrous, 1.5 in. long and 1 in. in diam.; the accrescent calyx at its base with 4 large broadly ovate membranous lobes with many vertical nerves and numerous distinct

minute reticulations, each lobe 1.25 long and nearly as wide. Dalz. & Gibs. Flora Bombay, 141; Bedd. Ic. Pl. Ind. Or. t. exxv, and Fl. Sylv. Madr. exliv; Hiern in Trans. Camb. Phil. Soc. XII. 190; Clarke in Hook, fil. Fl. Br. Ind. III. 570.

PERAK: King's Collector 7637, 8163.

The scanty specimens from Perak are in fruit only, but the leaves and fruit agree so well with those of *D. paniculata*—a species hitherto known only from the west of the Indian Peninsula—that, in spite of the anomalous geographical distribution, we, temporarily at least, refer the Perak specimens to that species.

28. DIOSPYROS KUNSTLERI, King & Gamble, n. sp. A tree 20 to 40 feet high; young branches as thick as a goose-quill, glabrous. Leaves alternate, large, thickly membranous; elliptic to elliptic-oblong, acute, the base rounded; both surfaces, when dry, olivaceous-brown, the lower rather darker than the upper, somewhat shining, faintly reticulate; main-nerves 8 to 12 pairs, much curved, spreading, ascending, and forming wide arches 25 in. from the edge, prominent on the lower surface like the midrib, somewhat depressed on the upper; length 8 to 12 in., breadth 3.5 to 4.5 in.; petioles 25 to 35 in. Male flowers unknown. Female flowers in short axillary and extra-axillary puberulous cymes, nearly 1 in. long, pedicellate; bracts narrow, nearly as long as the pedicels, oblong. Fruit in short stout cymes (unripe) depressedglobular, crowned by the short remains of the style, with 4 or 5 vertical ridges, everywhere densely rusty-tomentose, subtended by the accrescent almost woody calyx, with 4 deep reniform-cordate apiculate erect undulate lobes.

PERAK: King's Collector 4343, 7633, 8229.

29. Diospyros nutans, King & Gamble, n. sp. A shrub or small tree 8 to 16 feet high; young branches less than one-third as thick as a goose-quill, deciduously villous, the older much thicker with deeply channelled dark-coloured, sub-glabrous bark. Leaves alternate, thinly coriaceous; oblong or sub-oblanceolate-oblong, apex shortly caudate-acuminate, the base rounded; both surfaces brown when dry, the upper glabrous, the lower puberulous, but often villous on the prominent midrib; main-nerves 7 to 10 pairs, curved, ascending, interarching near the margin, the reticulations distinct; length 5 to 7 in., breadth 1·5 to 2·25 in.; petiole ·15 in. Cymes umbellate, few-flowered, borne on the apices of slender slightly supra-axillary flexuous puberulous peduncles much longer than the leaves (often twice as long); bracteoles few, small, lanceolate, concave. Male flowers in different cymes from the females, ·5 in. long, on short pedicels less than ·1 in. long. Calyx puberulous, campanulate, with 5 long lanceolate lobes. Corolla four times as long

as the calyx, narrowly tubular, slightly constricted at the throat, hairy outside, glabrous inside; the limb with 5 deep oblong lobes. Stamens 10, linear-elliptic, apiculate, inserted in the bottom of the tube, 5 sessile and 5 with filaments. Female flowers shorter than the 3, with small filamentous staminodes. Ovary narrowly ovoid, densely rufous-hirsute, attenuated into a long pubescent style crowned by 5 short glabrous reflexed small stigmas. Fruit narrowly ellipsoid, sparsely hairy, 6 to 1 in. long and 5 in. in diam., crowned by the persistent style and subtended by the non-accrescent calyx. Seeds few, narrowly ellipsoid.

Perak: Scortechini 674, 1678; King's Collector 378, 2675, 2987, 3573, 7087.

Differs from all the other Malayan species by its long peduncled pendulous inflorescence.

SPECIES IMPERFECTLY KNOWN.

30. DIOSPYROS REFLEXA, King & Gamble, n. sp. A tree 50 to 70 feet high; young branches as thick as a goose-quill, covered with a layer of minute deciduous rusty pubescence. Leaves alternate, thickly coriaceous; oblong to elliptic, shortly acuminate, the base cuneate; upper surface olivaceous-brown when dry, the lower pale brown, both minutely reticulate; main-nerves 8 to 10 pairs, spreading, interarching 15 in. from the slightly recurved edges; length 5 to 7.5 in., breadth 1.75 to 3 in.; petiole 4 or 5 in. Flowers unknown. Fruit hemispheric with depressed truncate apex, under 1 in. in diam.; the calyx embracing the very base of the fruit with 4 fleshy much reflexed revolute triangular fleshy lobes, densely rusty-tomentose like the fruit.

Perak: King's Collector 7676, 7747.

The curious fleshy calyx with much-reflexed lobes distinguishes this from all the other Malayan species.

31. Diospyros penangiana, King & Gamble, n. sp. A tree 20 to 30 feet high; young branches twice as thick as a crow-quill, covered with deciduous hair of two sorts, namely, a uniform coat of minute rusty tomentum with long rusty bristle-like hairs protruding through it. Leaves alternate, coriaceous; oblong, shortly and bluntly acuminate, narrowed below the middle to the rather broad auriculately cordate base; upper surface when dry pale brown, shining, glabrous except the puberulous depressed midrib; lower surface reddish-brown, transversely reticulate, with pubescence like that of the young branches on the stout midrib and 10 to 14 pairs of ascending rather straight main-nerves, otherwise glabrescent; length 5.5 to 7.5 in., breadth 1.25 to 2.25 in.; petioles .15 to .2 in. long, hispid. Male and female flowers unknown.

Fruit sessile, globular, from .75 to 1 in. in diam., densely covered with minute rufous tomentum, crowned by the short remains of the style and subtended by the small calyx with 5 broad reflexed lobes.

Penang: Curtis 2221.

Collected only in Penang. In leaves this resembles the Bornean plant named by Hiern Maba? cordata. The 5-cleft calyx of this is suggestive rather of Diospyros than of Maba.

32. Diospyros rufa, King & Gamble, n. sp. A tree 60 to 80 feet high; young branches about half as thick as a goose-quill or thicker, glabrous, brown and rough when dry. Leaves alternate, thickly coriaceous; oblong-elliptic, sometimes oblanceolate, the apex shortly and bluntly acuminate, the base much narrowed; upper surface warm brown when dry, glabrous, very shining; the lower dull, glabrous or slightly puberulous towards the base; main-nerves 7 to 10 pairs, spreading, little curved, interarching near the slightly incurved edges, slightly prominent on the lower surface and somewhat depressed on the upper when dry; length 5.5 to 7.5 in., breadth 1.75 to 2.25 in.; petioles 4 to 6 in., stout, channelled. Male and female flowers unknown. Fruit globular-ovoid, blunt, 1.25 to 1.5 in. long and about 1.15 in. in diam., densely rusty-tomentose. Calyx at base flat, 4-angled, 4 in. in diam., rusty-tomentose.

PERAK: King's Collector 3330, 4945, 5409, 6712.

33. DIOSPYROS AREOLATA, King & Gamble, n. sp. A tree 50 to 60 feet high; young branches thinner than a goose-quill, rusty-puberulous becoming glabrous. Leaves alternate, very coriaceous; oblong, subacute, the base rounded; both surfaces glabrous except the puberulous midrib and sometimes the main-nerves, hepatic-brown when dry; the upper shining, minutely and faintly areolate; the lower dull and boldly areolar-reticulate; midrib bold on the lower surface, slightly depressed on the upper; main-nerves about 7 pairs, curved, ascending abruptly, faint on the lower surface, almost invisible on the upper; length 4.5 to 6 in.; breadth 1.5 to 1.75 in.; petioles .5 or .6 in. Male flowers (only buds seen) under 5 in. in length, collected near the ends of the branches in tomentose cymes 5 to 1 in. long. Calyx coriaceous, on a thick pedicel shorter than itself, ovoid in bud; the mouth with triangular short teeth. Corolla like the calyx, but glabrous and fleshy. Stamens about 21; anthers linear, apiculate, nearly uniform, sub-sessile or on short broad flat filaments, sometimes slightly attached in groups of 3. Female flower probably solitary, much broader than the 3. Calyx velvety outside and inside, divided nearly to the base into 4 ovate-triangular very acute lobes 4 in. long. Corolla fleshy, glabrous, 6 in. long, its tube wide with staminodes like the anthers of the 3 but not so numerous; limb about as long as the tube, with 4 deep, broad, subquadrate spreading lobes. Ovary ovoid-conic, densely rusty-pilose. Stigmas 4, oblong, fleshy, glabrous. Fruit unknown.

Perak: Scortechini 476; King's Collector 5813.

34. DIOSPYROS CURTISH, King & Gamble, n. sp. A tree (?): young branches rather thicker than a goose-quill, rugulose and dark-coloured when dry, glabrous. Leaves alternate, thinly membranous; oblong or oblong-elliptic, shortly and bluntly acuminate, base rounded or slightly cuneate; both surfaces glabrous, the upper olivaceous when dry, the lower brown; main-nerves 7 to 9 pairs, slightly curved, ascending, faint on both surfaces; the midrib prominent on the lower surface, slightly so on the upper; length 2.5 to 5 in., breadth 1.25 to 2 in.; petioles .2 in. Male flowers not seen. Female flowers 25 in. long, in extra-axillary or axillary fascicles of about 3 on the younger branches; pedicels about ·2 in. long, cinerous-pubescent, each with 2 oblong obtuse bracteoles at its base, about .5 in. long. Calyx coriaceous, nearly .2 in. broad at the base, deeply divided into 4 triangular-reniform glabrescent lobes. Corolla partially glabrous, about as long as the calyx, salver-shaped; tube short; limb divided into 4 deep, broadly ovate, spreading lobes. Staminodes about 4, linear-lanceolate, compressed. Ovary narrowly oblong, tapering into the short thick style, densely tawny-tomentose. Fruit unknown.

Pulau Poongah: Curtis 2942.

35. Diospyros glomerulata, King & Gamble, n. sp. A tree 40 to 60 feet high; young branches rather thicker than a crow-quill, densely clothed with minute rufous pubescence. Leaves membranous, alternate; elliptic, shortly and bluntly apiculate, the base rounded or slightly cuneate; upper surface olivaceous when dry, glabrous; the lower brown, puberulous, midrib bold; main-nerves 5 or 6 pairs, slightly curved, ascending; length 2.25 to 3.5 in., breadth 1.25 to 1.75 in.; petiole about 1 in. Male flowers 2 in. long, crowded in dense sessile axillary and extra-axillary globular capitules 4 in. across. Calyx sessile, campanulate, tomentose, deeply divided into 4 broadly triangular subacute erect lobes. Corolla tubular, tetragonous, thick, about as long as the calyx; tube glabrous, the 4 lobes pubescent outside, oblong. Stamens 8, separate. Anthers broadly lanceolate, apiculate, filaments short. Female flowers and fruit not known.

Perak: King's Collector 8590.

The following description of a *Diospyros* from Pahang is taken from Ridley's account of the Flora of the Eastern Coast of the Malay Peninsula.

36. Diospyros caliginosa, Ridley in Trans. Linn. Soc. Ser. 2, III. 318 (1893). A graceful lofty tree; bark black; branches pubescent. Leaves alternate, elliptic-oblong, acute; 8 in. long, 3 in. broad; mainnerves 13 pairs; glabrous above, minutely pubescent beneath on the midrib and nerves; petiole ·25 in. long, minutely pubescent. Flowers on old wood, fascicled; peduncles short, covered with a black pubescence. Calyx of 3 flower patelliform; sepals 4, broadly ovate, obtuse, covered without and on the margin with black hair. Corolla urceolate, white, silky, ·5 in. long; lobes 4, short, ovate, recurved. Stamens 16, collected in pairs; filaments thick, minutely hispid; anthers glabrous, long-conical with acute tips. Ovary abortive, 4-lobed, irregular, the lobes furrowed; style conical. Flowers of ♀ not seen. Fruit small, globose, surrounded by the accrescent sepals.

Pahang: in thick woods at Kota Glanggi and Kwala Tembeling,

Ridley.

We are unable, having seen no specimen, to make quite sure of the place of this species. It seems to come very near to No. 17 D. tristis, King & Gamble.

Order LXXIII. STYRACEÆ.

Trees or shrubs. Leaves alternate, simple; stipules none. Flowers in simple or branched axillary or terminal racemes or spikes, sometimes solitary; usually white, rarely red; bracts small, often minute or obsolete. Calyx gamosepalous, the tube more or less adnate to the ovary. so that it may be superior or inferior; limb 4-5-toothed or truncate, persistent. Corolla of 4 to 5 petals, the tube usually short, sometimes none; petals imbricate or sometimes valvate or contorted. Stamens adnate to the petals, equal in number to them or double or very many; 1-many-seriate; filaments free or connate; anthers round or linear, dehiscing laterally. Ovary inferior or superior, 2-5-celled or sometimes, by the separation of the septa, 1-celled; style filiform, sometimes thick; stigma capitate, entire or lobed; ovules 1 or more, on the inner angle of each cell, pendulous or erect. Fruit drupaceous, indehiscent, 1-, rarely 2-3-seeded. Seeds albuminous, testa thin or coriaceous, hilum generally broad; embryo straight or curved, cotyledons terete or flattened; radicle cylindrical or short.—DISTRIB. Warmer regions of Asia, Australia, and America, absent from Africa; genera 7 or 8, species about 350.

1. Symplocos, Linn.

Trees or shrubs. Leaves alternate, often turning yellow when dry, entire or toothed. Flowers white, sometimes red, in axillary simple or compound spikes or racemes, sometimes in few-flowered fascicles, occasionally reduced to one flower; bracts small, solitary at the base of the pedicels; bracteoles 1 to 3, small, at the base of the flower. Calux-tube adnate, short when in flower, campanulate, often enlarged in fruit; lobes 5, imbricate. Petals 5 in one series, or 6 to 10 in two series, free or somewhat connate, or sometimes connate in a tube, imbricate. Stamens adnate to the corolla, at the base of the petals or higher up the tube, numerous, many-seriate, the outer the longest; filaments filiform, or sometimes flattened; anthers short, dehiscing in longitudinal parallel Ovary inferior, or semi-superior, 2-5-celled; style filiform; stigmas capitate, slightly lobed; ovules 2, pendulous from the inner angle of each cell. Fruit an oblong, ovoid or sub-globose drupe; endocarp woody or thin, often ridged or ribbed, 1-3-seeded. Seeds usually 1 only (by abortion); embryo terete, straight or curved, in the centre of fleshy albumen; cotyledons much shorter than the radicle.— DISTRIB. Warmer regions of Asia, Australia and America, species about 290 to 300.

Filaments more or less pentadelphous; corolla-tube divided		
nearly to the base (Subg. I. Hopea):—		
Fruit (where known) more or less ampulliform; embryo curved (Sect. i. Palura):—		
Inflorescence compound, branching at any rate at the		
base:—		
Branches of the inflorescence paniculately racemose,		
drupe nearly 5 in. long	1.	S. odoratissima.
Branches of the inflorescence racemose:—		
Racemes densely ferruginous-tomentose; pedicels		
	2.	S. fulvosa.
Racemes ferruginous-villous; pedicels 2 in. long,		
slender; leaves elliptic, under 4 in. long	3.	S. nivea.
Racemes pulverulent; pedicels ·2 in. long, slender;		
leaves obovate	4.	S. pulverulenta.
Racemes glabrous or slightly pubescent; pedicels longer		
than :05 in., slender :—		
Leaves over 4 in. long and 2 in. broad; calyx-lobes		
보다 얼마나 있는데 가는 적용되었다. 아무리 아들은 눈이에 있으면 하는데 하는데 이렇게 하는데 하다 하는데 하는데 하다 하는데 하다 하는데	5.	S. monticola.
Leaves under 4 in. long and 1.5 in. broad; calyx-	٥	G 6
lobes pubescent	ь.	S. Jasciculata.
Branches of the inflorescence spicate:—	(17	S umiaata
Leaves beneath and inflorescence glabrous or nearly so; endocarp of seed thin		
endocarp of seed thin Leaves beneath and inflorescence ferruginous-villous;		A COL . Metabotopocci
		S. ferruginea.
ondomp or book amen, bong	. 10 10 11	

[2] 등 사고로, 이미, 아마스 바로마스, 그리고, 아픈, 모든 아마스, 그리고, 맛이 모든 그리고 아마스 하는 것도 모든 그리고, 이번에 모르고 아마스 모든			
Inflorescence simple, racemose; racemes very short, almost reduced to fascicles	9.	S. Ridi	leyi.
Fruit (where known) ovoid-oblong, not ampulliform; embryo			
straight (Sect. ii. Lodera):—			
Inflorescence paniculate, branching usually from the base			
only:—			
Branches of the inflorescence racemose, more than '5 in.			
long:			
Leaves glabrous or nearly so; fruit glabrous:—			
Leaf-margins prominently broad-crenate, apex			
	10.	S. cela	strifolia.
Leaf-margins obscurely crenate or entire:—			
Leaf-margins prominently glandular, texture			
almost coriaceous	11.	S. ader	nophy ll a.
Leaf-margins not glandular, texture chartaceous			
	13.	S. Bra	ndiana.
Branches of the inflorescence racemose, under 5 in. long;			
leaf-margins entire or nearly so	14.	S. conc	color.
Inflorescence unbranched:—			
Inflorescence racemose:—			
Racemes 2 to 3 in. long, slender, few-flowered	15.	S. caly	codactylos.
Racemes very short:—			
Leaves coriaceous, acute or rounded or emarginate			
at apex; fruit ovoid-oblong, under ·5 in. long	16.	S. oph	irensis.
Leaves chartaceous, long-acuminate at apex, cuneate			
at base; fruit cylindric-oblong, over ·5 in. long	17.	S. Cur	tisii.
Leaves chartaceous; fruit not known:—			
Leaves 6 to 7 in. long, abruptly acuminate at			
apex, usually sub-cordate at base, quite glabrous	18.	S. cras	ssipes.
Leaves 4 to 7 in. long, long acuminate at apex,			
rounded at base, ferruginous-pilose beneath	19.	S. pen	angiana.
Inflorescence spicate :—	-		
Drupes large, over 1 in. in length; endocarp with 8			
prominent sharp ridges; leaves nearly glabrous:—			
Leaves usually under 6 in. long and 2 in. broad;			
young inflorescence without prominent bracts	20.	S. cera	ısifolia. •
Leaves usually over 6 in. long and 2 in. broad; young			
inflorescence prominently bracteate so as to appear			
strobilate	21.	S. rigi	da.
Drupes small, under '5 in. long; endocarp with faint			
ridges only; leaves rusty-pubescent beneath; young			
inflorescence strobilate	22.	S. rub	iginos $lpha$.
Filaments connate in a staminal tube; corolla-tube elongate			
(Subg. II. Cordyloblaste):—			
Corolla-tube scarcely ·3 in. long	23.	S. conj	fusa.
Corolla-tube about 1 in. long:—			
Inflorescence densely rusty-tomentose; leaves pubescent			
beneath	24.	S. Ma	ingay i . 🐪
Inflorescence slightly grey-pubescent; leaves glabrous	25.	S. Seo	rtechinii.
그는 동안 보고 있다. 그렇게 그 이자는 점점 하고 말라지지 않는데, 하는데, 하는데, 하는데, 하는데, 하는데, 하는데, 하는데, 하			

Subgenus I.—HOPEA.

1. Symplocos odoratissima, Choisy ex Zoll. Syst. Verz. 136 (1854). A tree with spreading branches reaching 60 to 70 feet in height and 18 to 24 in. in diam. of stem; branches grey, stout; branchlets dark greyish-brown, angled, striate, minutely puberulous; leaf-buds acuminate, 15 in. long. Leaves thinly coriaceous; elliptic or elliptic-obovate or elliptic-oblong, shortly acuminate at apex, cuneate or slightly rounded at base; glabrous on both surfaces; margin entire or serrate, blackish-brown when dry; 3 to 6 in. long, 2 to 2.5 in. broad; midrib slender, prominent beneath, impressed above; main-nerves 8 to 10 pairs, arching upwards to and along the margin where they meet in an intramarginal looped nerve near it; reticulations transverse, not prominent; petiole 4 to 6 in. long, flattened above. Inflorescence of grey-pubescent panicles, 1.5 to 2 in. long, axillary to the upper leaves, longer in fruit and stouter; branches paniculately racemose; bracts very small, deciduous; bracteoles 2, below the calyx-tube, ovate-acute, reflexed, 05 in. long; pedicels 15 in. long. Calyx-tube 05 in. long, pubescent; lobes 5, as long as tube, rounded. Corolla-tube very short; lobes ovate-obtuse, 15 in. long, pubescent on back, ciliate, white. Stamens in 5 bundles opposite corolla-lobes, very many, 80 to 100 in all; filaments slender; anthers rounded. Ovary villous; style thick, ·075 in. long, stigma lobed; cells 3, ovules 2 in each cell. Fruit an ampulliform drupe, 4 to 5 in. long, 25 in. broad, lower part rounded, upper cylindrical, crowned by the calvx-rim and connivent lobes, the calvx-rim 075 in. broad; exocarp corky, rusty-brown, slightly pubescent; endocarp hard. Seeds 1 to 3, usually 1 only perfect; testa membranous, albumen fleshy; embryo slightly curved, 15 in. long, radicle long. Mig. Fl. Ind. Bat. I. Pt. 2, 468; Koord. & Val. Bijdr. VII, 148; Brand Monog. Sympl. 35. Dicalyx odoratissimus, Blume Bijdr. 1116.

PERAK: King's Collector 10030, 10411, 10777. SINGAPORE: Ridley 4428 (this latter specimen has leaves up to 8 in. long and 3.5 in. broad).—DISTRIB. Sumatra (Beccari 834), Java, Borneo (Beccari 4014).

This is var. divaricata, Brand, which seems to us hardly separable, unless by the leaves being almost entire. In the Java and Sumatra specimens of G. odoratissima the leaves are markedly serrate.

2. Symplocos fulvosa, King & Gamble, n. sp. A very large tree, reaching 150 feet in height (Scortechini); branchlets dark-brown, young ones and innovations densely terruginous-tomentose. Leaves chartaceocoriaceous; elliptic, abruptly long blunt-acuminate at apex the acumen often curved, cuneate or attenuate at base; glabrous and shining above,

glabrous and dull beneath, ferruginous-brown when dry; margins faintly crenate-serrate, with a row of glands, slightly recurved; 3 to 4.5 in. long, 1.25 to 2 in. broad; midrib slender, slightly impressed above; main-nerves 6 to 8 pairs, the lowest pair close to the margin, the rest gradually more distant upwards, curved upwards to and along the margin where they meet in a looped intramarginal nerve; reticulations many, forming an elegant network; petiole .75 in. long. Inflorescence of tripartite sessile panicles of racemes, the racemes 1 to 2 in. long, densely ferruginous-tomentose; bracts and bracteoles minute, hidden in the tomentum; pedicels thick, 05 in. long; flowers white, then yellowish. Calyx-tube short; lobes very short, rounded, densely tomentose without. Corolla-tube short; lobes ovate-oblong, glabrous, 15 in. long, 3-5-nerved. Stamens many, obscurely separated in bundles; filaments slender; anthers very small rounded. Ovary and disk glabrous, style glabrous, .075 in. long, stigma capitate; cells 3. Fruit unknown.

PERAK: Scortechini 563, 567.

3. Symplocos Nivea, Brand Monog. Sympl. 36 (1901). reaching 50 to 60 feet in height; branchlets slender, rounded, dark brown, glabrous; leaf-buds ovate-acuminate, tawny-pubescent. Leaves chartaceo-coriaceous; elliptic or elliptic-oblong, acute or acuminate at apex, cuneate at base; glabrous and shining above, glabrous and pale beneath, dark olive-brown when dry; margins obscurely undulatecrenate, recurved; 3 to 4 in. long, 1 to 1.75 in. broad; midrib slender, impressed above; main-nerves 5 to 6 pairs, irregularly spaced and often branched, at first straight then curved upwards to and along the margin where they anastomose in a looped intramarginal nerve; reticulations obscure; petiole slender, 3 to 4 in. long. Inflorescence an axillary panicle of villous racemes 2 to 3 in. long, the racemes 12-15-flowered; bracts and bracteoles ovate-lanceolate, villous, quickly caducous; pedicels slender, ·2 in. long. Calyx-tube adnate to the ovary; lobes 5, oblong-obtuse, 1 in. long, glabrous, persistent. Corolla pure white; lobes twice as long as those of the calyx. Stamens about 60, as long as the corolla. Ovary glabrous, 1-celled, ovules apparently 2; style slender from a conical villous base. Fruit unknown.

Penang: at Pulau Boetong, Government Hill and Muka Head, Curtis 715.

4. Symplocos pulverulenta, King & Gamble, n. sp. A tree (?); ultimate branchlets and inflorescence grey- or golden-pulverulent-scaly; leaf-buds lanceolate-acuminate. *Leaves* membranous; obovate, abruptly short acuminate at apex, cuneate often unequally at base; glabrous on both surfaces except on the nerves, olive-green when dry; margins

entire; 5 to 7 in. long, 2 to 3 in. broad; midrib slender, impressed above; main-nerves 8 to 9 pairs, curving upwards to and along the margin; reticulations transverse, prominent and slightly raised above; petiole 7 to 8 in. long, smooth, pulverulent-pubescent. Inflorescence of axillary panicles of racemes about 2 in. long; main rachis 7 in. long; branches sub-opposite, about 2 pairs, 5 to 1 in. long; bracts short, ovate, caducous; bracteoles 2, ovate-acute, under the calyx-tube; pedicels slender, 15 to 2 in. long; flowers yellow, buds globose. Calyx-tube funnel-shaped, 06 in. long; lobes 5, short, rounded. Corolla-tube short; lobes 5, ovate, obtuse, pulverulent-pubescent. Stamens very numerous, probably 200 at least, in 5 bundles opposite the corolla-lobes; filaments slender; anthers very small, rounded. Ovary and disk pubescent; style stout, stigma capitate; cells 2, ovules several. Fruit not known.

SINGAPORE: at Chanchukam, Ridley 4786.

5. Symplocos monticola, King & Gamble, n. sp. A shrub or small tree reaching 20 feet in height and 3 in. in diam. of stem; branchlets somewhat slender, pale brown, sinuous; leaf-buds small, acuminate. Leaves chartaceous; elliptic or elliptic-oblong, acuminate at apex, cuneate or somewhat rounded at base; glabrous on both surfaces. greenish-brown when dry; margins serrate except near the base, slightly recurved; 4 to 6 in. long, 2 to 2.5 in. broad; midrib slender, pale, impressed above; main-nerves 6 to 8 pairs, close near the base, gradually more distant, curved upwards to meet in a looped intramarginal nerve: secondary nerves few, reticulations transverse; petiole 25 in. long, channelled above. Inflorescence a fascicle of racemes either from the axils of leaves a little below the last, or from the new wood below them; racemes .5 to 1.5 in. long, 6-8-flowered, all parts nearly glabrous; bracts ovate, very minute; pedicels 0 to 1 in. long; bracteoles 2, ovate, acute, ciliate. 05 in. long, at the base of the calvx-tube. Calvx-tube short; lobes as long (1 in.), thin, glabrous, round. Corolla-tube very short; lobes 5, thin, oblong, obtuse, 2 in. long, 3-nerved. Stamens many, more than 80, in 5 bundles opposite the corolla-lobes; filaments slender; anthers rounded. Ovary and disk glabrous or slightly pubescent; style short, 1 in. long; stigma capitate; cells 3. Fruit not known.

PERAK: Scortechini 533; King's Collector 3804, 6927, in dense jungle on the summits of mountains at 4,000 to 4,600 feet.

6. Symplocos fasciculata, Zoll. Syst. Verz. 136 (1854). A tree with spreading branches reaching 40 to 50 feet in height and 10 to 15 in. in diam. of stem; branchlets pale greyish-brown, slender, innovations greyish-pubescent. Leaves thinly chartaceous or membranous; oblong-lanceolate, long acuminate at apex, the acumen curved and mucro-

nate, rounded or obtusely rhomboid at base; glabrous and shining above, glabrous beneath except on the midrib, yellowish when dry: margins entire or obscurely and distantly serrate, slightly recurved; 2 to 4 in. long, .7 to 1.5 in. broad; midrib slender, impressed above, minutely pilose beneath; main-nerves about 5 to 7 pairs, indistinct, curved upwards and meeting in an intramarginal looped nerve rather distant from the margin; secondary nerves and reticulations slender, obscure; petiole 2 in. long, bordered above by the decurrent margin of the blade and minutely pilose. Inflorescence a short fascicle of axillary cymes or racemes 5 to 7 in. long, ashy-pubescent; bracts very minute; pedicels slender, 15 in. long; bracteoles 3, minute, ovate, acute, ciliate. Calyx-lobes 5, rounded, obtuse, '05 in. long, pubescent without. Corolla-lobes oblong, obtuse, ·1 to ·15 in. long, glabrous, 5-nerved; tube very short or almost none. Stamens in 5 bundles opposite the corolla-lobes, about 20 to 25 or sometimes more; filaments slender, outer ones exsert; anthers minute, rounded, emarginate. Ovary depressed at top, disk glabrous, cells 3; style slender. 075 in. long, ending in a flattened 3-lobed stigma. Fruit an ampulliform drupe, ovoid below for 2 in. in length, 15 in. in diam., glabrous, 5-6-ribbed, tipped by a cylindric beak 05 in. long and by the persistent calvx-lobes; exocarp thin, endocarp hard, furrowed, furnished within with 3 to 6 strong ribs, enclosing a much-lobed seed; testa thin; albumen fleshy; embryo very slightly curved, 15 in. long. Miq. Fl. Ind. Bat. I. Pt. 2. 467; Clarke in Hook. f. Fl. Br. Ind. III. 574; Koord, & Val. Bijdr. 7. 150; Brand Monog. Sympl. 34. Dicalyx tinctorius, Bl. Bijdr. 1116.

Penang: Curtis 3171. Perak: Wray 1865, 2418, 2466, 2739, 3561; Scortechini 128, 1527; King's Collector 1042, 2021, 3003, 4739, 5175, 5337, 10525. Selangor: Ridley 8209. Malacca: Maingay (K.D.) 958; Griffith (K.D.) 3665; Holmberg 867. Johore: G. King. Singapore: Murton 143; Ridley 3626a, 8209.—Distrib. Sumatra (Forbes 2355, 2358, 2563, 2812); Java (Forbes 218); Borneo (Beccari 2380; Haviland 1024, 1545).

After a great deal of trouble the seed with albumen and embryo were separated. The walls of the shell of the fruit are furnished inside with projecting ribs, so that the seed resembles that of a small walnut and the embryo is slightly curved, long and narrow, and might be called straight. Koorders & Valeton's description is thus confirmed.

7. SYMPLOCOS SPICATA, Roxb. Hort. Beng. 40 (1814), and Fl. Ind. II. 541; Wall. Cat. 4417; A.DC. Prod. VIII. 254; Wight Ill. t. 150; Miq. Fl. Ind. Bat. I. Pt. 2. 465; Bedd. Fl. Sylv. Madr. cxlix; Brandis For. Fl. 300; Kurz in Journ. As. Soc. Beng. XLVI. ii. 239 and For. Fl. II. 146; Clarke in Hook. f. Fl. Br. Ind. III. 573; Trimen Fl. Ceyl. III. 104;

Cooke Fl. Bomb. II. 108; Koord. & Val. Bijdr. VII. 144. S. polycarpa, Wall. Cat. 4423; DC. l.c. 255; Kurz ll.c. S. Loha, Don Prod. 144; DC. l.c. 255. S. racemosa, Wall. Cat. 4418 (in part, not of Roxb).

VAR. malasica, Clarke in Hook. f. Fl. Br. Ind. III. 573. A small tree with spreading branches, reaching 30 to 40 feet in height and 1 foot in diam. of stem; branchlets dark grey-brown, smooth, innovations glabrous; buds lanceolate acuminate. Leaves coriaceo-chartaceous, alternate; elliptic- or oblong-lanceolate, acute or acuminate at apex, cuneate at base; entire or serrate, glabrous on both surfaces, turning yellow when dry; margin distantly and slightly denticulate, glandular; 4 to 7 in. long, 1.5 to 2.5 in. broad; midrib thick, impressed above; main-nerves about 10 pairs, irregular, curved upwards and branching towards the margin; secondary nerves few; reticulations prominent on the under surface; petiole 4 to 7 in. long, channelled above. Inflorescence an axillary panicle of spikes, the branches mostly near the base; spikes 1.5 to 4 in. long, glabrous or slightly pubescent; bracts very small, deciduous; bracteoles under each flower 3, ovate, acute or obtuse, ciliate, 05 in. long. Calyx-lobes 5, rounded, imbricate, glabrous, tube as long as lobes, the latter 05 in. long. Corolla 5-lobed, white or yellowish; tube very short; lobes ovateorbicular, 1 to 15 in. long. Stamens indefinite, about 40, the outer ones longer than the petals, inserted on the corolla-tube; filaments slender; anthers short, rounded. Ovary inferior, 3-celled; ovules 3 to 4 in each cell; style thick, 1 in. long, stigma capitate. Fruit a globose drupe ·15 to ·2 in. long, surmounted by a rim formed by the short calvx-lobes, smooth, olive-coloured, exocarp and endocarp thin, ribbed. Seed 1, testa thin, albumen rather scanty; embryo curved.

Perak: Wray 2798; Scortechini; King's Collector 6299, 6903. MALACCA: Griffith; Maingay (K.D.) 957; Derry 506.

Var. acuminata, Brand Monog. Sympl. 40. Leaves long acuminate, blunt at the tip, serrulate, 3 to 5 in. long, 1 to 2 in. broad; mainnerves 7 to 8 pairs, all nerves and reticulations, except the impressed midrib, prominent on the upper surface in young leaves. Flowers sometimes pedicellate. Fruit somewhat urceolate, ribbed. Symplocos acuminata, Miq. Fl. Ind. Bat. I. Pt. 2. 467. Dicalyx acuminatus, Bl. Bijdr. 1119.

Perak: Scortechini 1556. — Distrib. Java, Sumatra (Forbes 3208).

Var. attenuata, Clarke in Hook. f. Fl. Br. Ind. III. 573. Leaves long acuminate at apex, long attenuate at base, 3 to 4 in. long, 1 to 1.25 in. broad; margins serrate. Spicate branches of the inflorescence slender, usually short. Fruit small, often only 1 to 15 in. in diam.

S. attenuata, Wall. Cat. 4426; A. DC. Prod. VIII. 256; Brand Monog. Sympl. 39.

KEDAH: King's Collector 1764.—DISTRIB. Assam, Burma.

8. Symplocos ferruginea, Roxb. Hort. Beng. 40 (1814), Fl. Ind. II. 542. A tree with spreading branches reaching 50 to 60 feet in height and 1 foot in diam. of stem; branchlets stout, dark brown, smooth, innovations densely ferruginous-villous. Leaves coriaceous; elliptic or elliptic-lanceolate, acuminate at apex, cuneate at base; glabrous and shining above, ferruginous-villous especially on the nerves beneath, turning yellow when dry; margins serrulate, denticulate or almost entire, recurved; 5 to 8 in. long, 1.5 to 3 in. broad; midrib stout, very prominent beneath, impressed above; main-nerves 12 to 14 pairs, prominent beneath, parallel at first and straight for some distance then arching near the margin; secondary nerves few; reticulations obliquely transverse, not prominent; petiole 3 to 5 in. long, densely rusty-villous, thick. Inflorescence an axillary panicle of spikes, 2 to 6 in. long, the spikes and panicle short in bud, longer in flower, much elongated in fruit, the branches of the panicle mostly near the base, densely ferruginous-villous; bracts very small, ovate-acute, villous; bracteoles under each flower 3, the central one 12 in. long, ovate-acuminate, the two outer shorter, ovate-acute, the three together as long as the calvx. Calyx 5-lobed; lobes ovate-obtuse, 1 in. long, pubescent without. Corolla 5-lobed, white, rotate; tube '05 in. long; lobes '1 in. long, oblong-obtuse, 3-nerved. Stamens indefinite, 40 to 70, in 5 fascicles inserted on the corolla-tube; filaments slender, gradually increasing in length from the inside outwards, the outer ones a little longer than the petals; anthers rounded, short. Ovary depressed, disk glabrous; cells 3; style thick, ·1 to ·2 in. long, stigma 3-lobed; ovules several in each cell. Fruit a globose or ampulliform drupe, faintly ribbed, 15 to 2 in. long, surmounted by the persistent calyx with enlarged connivent teeth; exocarp thin; endocarp very hard, bony, about 12-14-ribbed, globose below, cylindric and very short above. Seed 1, testa thin, albumen rather scanty; embryo curved, 1 to 15 in. long. Wall. Cat. 4412; A. DC. Prod. VIII. 257; Miq. Fl. Ind. Bat. I. Pt. 2. 466; Clarke in Hook. f. Fl. Br. Ind. III. 574 (var. exc.); Koord. & Val. Bijdr. VII. 141; Brand Monog. Sympl. 40. S. mollis, Wall. Cat. 4433; G. Don Gen. Syst. IV. 3. S. Verhuellii, Jungh. & de Vriese Pl. Nov. Ind. Or. 12; Miq. l.c. 467. S. javanica, Kurz in Journ. As. Soc. Beng. XLVI. ii. 239 (syn. S. rubiginosa exc.) and For. Fl. II. 145. S. lachnobotrya, and S. Horsfieldiana, Miq. Fl. Ind. Bat. Suppl. 475. Dicalyx javanicus, Blume Bijdr. 1117.

Penang: Wallich 4433; Phillips; Curtis 206; King's Collector

1353. PERAK: Wray 3387; Scortechini 900; King's Collector 925, 4376, 4395, 4683, 5235, 6219, 7091, 8646, 11019. Pahang: Ridley in Trans. Linn. Soc. Ser. 2, III. 318. Malacca: Maingay (K.D.) 956.—Distrib. Assam, Burma, Java (Forbes 682, 798, 861, 1203), Sumatra (Forbes 2614, 2691, 3150; Beccari 842), the Moluccas, the Philippines, and S. China.

The leaves in this species are very variable; for instance, those of King's Collector Nos. 4395, 4683 have oblong-lanceolate leaves 6 to 8 in. long and about 2 in. broad, with more distant nerves, and are nearly glabrous beneath; but some of the leaves approach very nearly to those of other specimens, and we cannot therefore separate it as a variety. The marked elongation of the fruiting inflorescence is another source of difficulty in superficial identification.

9. Symplocos Ridleyi, King & Gamble, n. sp. A medium-sized tree; branchlets glabrous, angled, striate; leaf-buds acuminate, glabrous. Leaves coriaceous; ovate or oblong, acuminate at apex, attenuate at base; glabrous on both surfaces, shining above, greenish-yellow when dry; margins entire or remotely and faintly denticulate, recurved; 3 to 4 in. long, 1 to 1.5 in. broad; midrib slender, raised above; main-nerves 8 to 9 pairs, raised on both surfaces, straight, meeting in a looped intramarginal nerve; secondary nerves few; reticulations prominent, raised above; petiole 3 in. long, channelled above. Inflorescence of sessile or very short few-flowered axillary racemes, as long as the petiole; rachis silky-pubescent; bracts and bracteoles orbicular, ciliate, pubescent; pedicels none or very short. Calyx-lobes orbicular, thin, ciliate, 1 in. broad, concave; tube very short. Corolla-tube very short, lobes ovate, ·12 to ·15 in. long, 3-5-nerved, white. Stamens about 50, in bundles opposite the corolla-lobes; filaments slender, the outer ones a little longer than the corolla-lobes; anthers rounded. Ovary villous, 3-celled, ovules 2 in each cell; disk glabrous; style thick, 1 in. long, stigma capitate, lobed. Fruit not known.

SINGAPORE: Ridley 5684.

A species very closely allied to $S.\ phyllocalyx$, Clarke, of N. India and China, and to $S.\ japonica$, A. DC. of Japan.

10. Symplocos celastrifolia, Griff. MS.; Clarke in Hook. f. Fl. Br. Ind. III. 575 (1882). A tree (?); branchlets smooth, slender, glabrous. Leaves chartaceous; elliptic or elliptic-oblong, shortly and bluntly acuminate at apex, cuneate at base; glabrous on both surfaces, greenish-brown above, yellowish beneath when dry; margins crenate, slightly recurved; 2.5 to 5 in. long, 1.5 to 2.25 in. broad; midrib slender, impressed above; main-nerves 6 to 8 pairs, irregular, not prominent, at first straight, then curving upwards and branching to meet

near the margin in an intramarginal network; reticulations obscure; petiole ·2 to ·3 in. long, bordered by the decurrent margins of the blade. Inflorescence a few- and basally-branched pubescent paniele of long slender racemes, 2·5 to 3 in. long; racemes 12–16-flowered; pedicels ·1 in. long; bracteoles 2, lanceolate, ·05 in. long, ciliate, pubescent. Calyx-tube ·05 in. long; lobes 5, oblong, obtuse, ·075 in. long. Corolla white, sweet-scented; tube very short; lobes ovate-oblong, ·2 in. long. Stamens in 5 bundles opposite the corolla-lobes, 40 to 70, the outermost the longest and equal to the corolla-lobes. Ovary depressed, disk glabrous; cells 3; style ·125 in. long, stigma capitate. Fruit an ovoid-ellipsoid drupe, ·25 in. long, smooth, tipped with the rim and erect teeth of the persistent calyx. Seeds 1 to 3, testa membranous; embryo slender, straight, ·1 in. long. Brand Monog. Sympl. 48.

Penang: Curtis 3459. Malacca: Griffith (K.D.) 3651.—Distrib. Borneo (Teysmann, Motley, Beccari 2374, Haviland 509b, 1642, 3706).

11. SYMPLOCOS ADENOPHYLLA, Wall. Cat. 4427 (1829). A tree reaching 50 to 60 feet in height, stem 15 to 20 in. in diam.; branchlets dark brown, smooth, upper parts and innovations dark rusty-glandularpubescent. Leaves chartaceo-coriaceous; narrowly lanceolate to ellipticlanceolate and elliptic; obtusely long caudate-acuminate at apex, cuneate or attenuate at base; glabrous on both surfaces, shining or not, olive-brown or dark reddish-brown when dry; margins crenate or subentire, the crenatures with large glands, sometimes recurved; 3 to 5 in. long, 7 to 1.5 in. broad; midrib slender, impressed above; main-nerves 5 to 8 pairs, distant, arching upwards to join in a looped intramarginal nerve at about two-thirds of the distance to the margin; secondary nerves and reticulations obscure; petiole 3 to 5 in. long, often bent. Inflorescence a 3- and basally-branched axillary panicle of racemes, glandular-rusty-pubescent, 1 to 2 in. long, racemes about 12-flowered; bracts ovate-acute, caducous; pedicels 05 to 1 in. long; bracteoles minute, thin, obtuse. Calyx-tube glabrous or minutely pubescent, 05 in. long; its teeth very minute, triangular or rounded, rusty-pubescent. Corolla yellowish-white, tube short; lobes oblong, rounded, about ·15 in. long, incurved at tip. Stamens 40 to 50, in 5 bundles opposite the corolla-lobes, outer ones as long as those lobes; filaments slender; anthers small, rounded. Ovary depressed, disk glabrous, cells 3; style slender, 1 in. long; stigma capitate. Fruit an oblong-cylindrical or ellipsoid drupe 3 to 35 in. long and half as broad, smooth, pale yellowish-brown, crowned with the minute, inconspicuous, muchincurved, persistent calyx-teeth; exocarp smooth, thin; endocarp bony, ribbed. Seed 1; embryo straight, pendulous. G. Don Gen. Syst. IV. 3; A. DC. Prod. VIII. 257; Miq. Fl. Ind. Bat. I. Pt. 2, 466;

Clarke in Hook. f. Fl. Br. Ind. III. 575; Brand Monog. Sympl. 48; Stapf in Trans. Linn. Soc. 2nd Ser. IV. 204. S. iteophylla, Miq. Fl. Ind. Bat. Suppl. 476; Brand l.e. S. bancana, Miq. l.e.

Kedah: Ridley 5533. Penang: Wallich 4427a; Maingay (K.D.) 959; Curtis 402, 445. Perak: Wray 1119, 3842, 3925, 4123; Scortechini 490; King's Collector 1269, 2606, 6873. Selangor: Ridley 7553, 8549. Malacca: Griffith (K.D.) 3649. Singapore: Wallich 4427b; G. Thomson; Hullett 828; Walker 255; Ridley 3635a, 3809.—Distrib. Sumatra (Beccari 147); Bangka (Horsfield 39); Borneo (Beccari 2115, Lobb, Haviland 1187).

A variable species as regards the leaves and the length of the inflorescence; the prominent glands on the margins of the leaves are a noticeable character.

12. Symplocos perakensis, King & Gamble, n. sp. A tree with spreading branches reaching 50 to 60 feet in height; stem 15 to 20 in. in diam; branchlets dark brown, very slender. Leaves chartaceous; elliptic, long caudate-acuminate at apex, cuneate at base; glabrous on both surfaces, green when dry; margins entire, recurved; 2 to 3.5 in. long, 1 to 1.5 in. broad; midrib slender; main-nerves 6 to 7 pairs, the two lowest near the margin and produced upwards along it, the others curved upwards to meet in a looped intramarginal nerve, which is rather prominent; secondary nerves and reticulations obscure; petiole 2 in. long, channelled above. Inflorescence a sessile 3-branched panicle of racemes axillary to the upper leaves or on the branchlets below them, 1 to 2 in. long or less; panicle branches and racemes very slender, the latter about 8-10-flowered; rachis grey-pubescent; 1 bract and 2 bracteoles, ovate-acute, scarcely 05 in. long, persistent; pedicels about 05 in. long. Calyx-tube short; lobes 5, rounded, grey-pubescent, ciliate, 05 in. long, as long as tube. Corolla-tube short; lobes oblong, white, 125 in. long. Stamens about 40, in 5 bundles opposite the corolla-lobes; filaments slender, exsert; anthers rounded, minute. Ovary villous; cells 3; style rather thick, villous, 1 in. long, stigma small. Fruit a cylindrical glabrous drupe, 4 to 5 in. long, 25 in. in diam., the top rusty-hirsute and crowned by the persistent rustyhirsute calyx-lobes, the calyx-rim 1 in. broad; exocarp fleshy, endocarp hard, bony. Seeds 3, testa rather thick, embryo straight.

Perak: Scortechini 646; Wray 2593, 2944; King's Collector 4446, 4570, 4586, 7863, 10163, 10501, 10515, 10801, 10985. Selangor: Ridley 10223.

This species is very near to S. adenophylla, but the leaves are entire, much thinner and smaller, and not glandular, and the inflorescence is more compound, more slender, grey- and not rusty-pubescent, and has rounded calyx-lobes.

13. Symplocos Brandiana, King & Gamble, n. sp. A small tree reaching 15 to 25 feet in height; stem 4 to 6 in. in diam.; branchlets round, densely covered with soft ferruginous tomentum and long stiff hispid hairs; innovations densely ferruginous-silky-tomentose. Leaves membranous; ovate-oblong, long acuminate at apex, rounded or cordate at base; pilose on both surfaces, at length glabrescent above, paler beneath, olive-brown when dry; margin entire, recurved, thickly villous; 3 to 6 in. long, 1 to 2 in. broad; midrib slender, prominent beneath; mainnerves about 8 pairs, much curving upwards to join as a looped intramarginal nerve, raised beneath; reticulations obscure; petiole scarcely ·1 in. long. Inflorescence of axillary few-flowered racemes or panicles up to 1.5 in. long, lax-flowered; rachis slender, thickly ferruginousvillous, as are the bracts and calyx; bracts leaf-like, cuspidateacuminate, 2 to 4 in. long; bracteoles 2, similar but smaller; pedicels 1 in. long; flowers white. Calyx-tube very short; lobes linearlanceolate, 1 to 2 in. long. Corolla-tube very short; lobes ellipticobtuse, glabrous, 3-nerved, 15 in. long. Stamens 60 to 70 or even more, in 5 bundles opposite the corolla-lobes; filaments slender; anthers small, rounded. Ovary and disk villous, style slender, stigma capitate. Fruit oblong-cylindrical, light blue, constricted above the middle, villous, 8 in. long, 3 in. broad; exocarp fleshy, endocarp crustaceous; cells 3, the lower one bearing 1 seed; albumen fleshy; embryo slightly curved.

PERAK: Curtis 2030; Scortechini 346, 349 on Maxwell's Hill, 3,000 feet; Wray 677 at Waterfall Hill, Larút; King's Collector 1887, in dense jungle on rocky creeks.

We have named this handsome species in honour of the author of the most recent monograph of the genus.

14. Symplocos concolor, Brand Monog. Sympl. 65 (1901). A tree, reaching 30 to 40 feet in height; branchlets dark brown, innovations tawny-pubescent. Leaves thinly coriaceous; oblong or oblong-obovate, abruptly acuminate at apex, the acumen mucronate, attenuate at base; glabrous on both surfaces, shining above; margins entire or obscurely dentate; 3 to 4 in. long, 1–1.5 in. broad; midrib slender, slightly raised above; main-nerves 6 to 7 pairs, rather obscure, arching upwards to anastomose near the margin; reticulations prominent; petiole about 1 in. long. Inflorescence of sessile or very shortly peduncled, 3-branched panicles up to 5 in. long, all golden-pubescent, about 10–12-flowered; bracts ovate-acute, small; bracteoles smaller, 2 to each pedicel; pedicels slender, about 1 in. long. Calyx-tube funnel-shaped, 05 in. long; lobes 5, rounded, short. Corolla-tube very short; lobes oblong, 1 in.

long. Stamens about 60, scarcely exsert. Ovary and disk silky-pubescent; style slender, stigma capitate, 3-4-lohed. Fruit an oblong glabrous drupe, '3 in. long, '15 to '2 in. broad, surmounted by the slightly depressed disk which is shortly overtopped by the calyx-lohes.

PENANG: on Penam Bukit at 2,000 feet, Curtis 1039.

15. Symplocos calycodactylos, Brand Monog. Sympl. 63 (1901). A tree (?); branchlets villous with long tawny spreading bristles, innovations densely villous. Leaves membranous; oblong-lanceolate, longacuminate at apex, rounded at base, sometimes almost cordate; both surfaces covered sparsely with tawny bristles, especially on and along the nerves beneath; margins distantly long glandular denticulate; 4 to 5.5 in. long, 1.5 to 2 in. broad; midrib slender, impressed above: main-nerves about 8 pairs, curving slightly upwards at an angle of about 30° with the midrib to anastomose near the margin; reticulations prominent, primary ones transverse parallel; petiole stout, villous, 15 to 2 in. long. Inflorescence a slender, axillary, tawny-villous raceme, 2 to 3 in. long, with about 4 to 5 flowers; bracts lanceolate-acuminate. 25 in. long, caducous; pedicels 5 in., very slender, ending in a dense tuft of tawny bristles beneath the calyx. Calyx-tube short; lobes 5, linear oblong, densely tawny-bristly without, glabrous within, 25 in. long. Corolla-tube short; Jobes 5, obovate, glabrous, as long as calvxlobes or slightly longer. Stamens about 80, 5-adelphous, filaments flattened; anthers small, rounded. Ovary and disk villous; style slender, 1 in. long; stigma small, capitate. Fruit unknown.

PERAK: at Waterloo, 3,000 feet, Curtis 1330.

16. Symplocos ophirensis, Clarke in Hook. f. Fl. Br. Ind. III. 479 (1882). A bush (Wray), or more probably a small tree; branches terete, nearly black, glabrous; innovations appressed-tawny-pubescent; buds ovate-acuminate, silky, 1 in. long. Leaves coriaceous; elliptic or ellipticlanceolate, acute or rounded or sometimes emarginate at apex, cuneate or rounded at base; glabrous and usually shining above, sparsely pubescent beneath when young, afterwards glabrous, reddish-brown when dry; margins entire or very obscurely denticulate, recurved; 2 to 4 in. long, 1 to 1.5 in. broad; midrib stout, impressed above; main-nerves 8 to 10 pairs, raised on both surfaces, straight at first, then curving upwards and joining in an intramarginal looped nerve; secondary nerves many, similar, reticulations prominent; petiole stout, 1 to 2 in. long. Inflorescence of very short racemes, from the axils of the upper leaves or from the new wood below them; racemes 3 to 4 in. long, silky-pubescent, 5-7-flowered; bracts and bracteoles very small, ovate, acute; pedicels 0 to 1 in. long. Calyx-lobes 5, silky-pubescent, ovateacute, ciliate, 6 in. long; tube 1 in. long. Corolla-tube short; lobes

white, oblong-obtuse, ·2 in. long, 5-nerved. Stamens in bundles of 6 to 12 each opposite the corolla-lobes, 30 to 60 in all; filaments slender, outer as long as petals; anthers rounded, very small. Ovary and disk nearly glabrous at top; style slender, ·15 to ·2 in. long, stigma capitate; cells 3, ovules 2 in each cell. Fruit ovoid-cylindric, blueish-purple when ripe, ·3 to ·4 in. long, ·2 in. broad, surmounted by calyx-rim with patent lobes, nearly as wide as the top of the fruit; exocarp crustaceous; endocarp very hard, bony, obscurely ribbed and irregularly indented. Seed 1, testa membranous, albumen fleshy, embryo straight. Brand Monog. Sympl. 58. Symplocos No. 42, Herb. Ind. Or. Hook. f. & Th.

PERAK: on Gunong Bubu, 5,000 feet, Wray 3919; Scortechini. MALACCA: on Mount Ophir, Griffith (K.D.) 3650; Ridley 10083; Derry 623; Lobb.

The specimens of Wray and Scortechini have the leaves rounded at both ends, but there seems no reason to keep them as a separate variety from the specimens from Mount Ophir which are acute at apex and cuneate at base.

17. Symplocos Curtisii, Oliv. in Hook. Icon. t. 1757 (1888). A shrub or small tree, reaching 10 to 15 feet in height; branchlets slender, pale brown, glabrous; leaf-buds small, acuminate, pubescent. Leaves chartaceous; elliptic, abruptly long acuminate at apex, cuneate at base; glabrous on both surfaces, pale greenish-brown when dry; margins obscurely denticulate, slightly recurved; 4 to 9 in. long, 1.5 to 3 in. broad; midrib slender, raised beneath, impressed above; main-nerves 5 to 7 pairs, the lowest pair very near the margin, the rest gradually more and more distant, all curving upwards to and along the margin. where they form an intramarginal looped nerve; secondary nerves very few or none; reticulations transverse, fairly prominent, rather distant; petiole 2 to 4 in. long, channelled above. Inflorescence of short (up to ·4 in. long) racemes axillary to the upper leaves or on the young wood below them; racemes about 5-flowered; bract ovate-acute. 1 in. long. keeled, villous; bracteoles 2, similar but smaller; pedicels stout, about ·05 in. long. Calyx-tube about ·1 in. long; lobes 5, ovate, obtuse, as long as tube, all minutely pubescent without. Corolla-tube very short, lobes elliptic-oblong, 2 in. long, 5-nerved, white. Stamens many, 60 or more; filaments slender, longer than corolla-lobes; anthers rounded, minute; staminal bundles only noticeable in bud. Ovary villous, disk glabrous; style slender, 2 in. long, stigma capitate; cells 3, ovules 2 in each cell. Fruit a cylindric oblong berry, bright blue when ripe. 5 to ·8 in. long, somewhat constricted at about one-third distance from the top; the top surmounted by the calyx-rim and connivent teeth; exocarp crustaceous, endocarp woody; cells 1 to 3. Seed usually 1, testa membranous, albumen fleshy, embryo straight. Brand Monog. Sympl. 69.

Penang: Curtis 1099. Perak: Wray 692, 2830; Scortechini 328, 646, 1423; King's Collector 2084, 2099, 2406, 8431.

18. Symplocos crassipes, Clarke in Hook. f. Fl. Br. Ind. III. 580 (1882). A tree (?); branchlets stout, smooth, grey. Leaves stoutly chartaceous; large, elliptic-lanceolate, abruptly acuminate at apex, subcordate or obtusely rhomboid at base; glabrous on both surfaces; margins sub-entire, slightly recurved; 6 to 7 in. long, 2 to 3 in. broad; midrib prominent, thick; main-nerves 10 to 12 pairs, irregular and at irregular angles, usually only slightly curved upwards to meet in a looped intramarginal nerve '25 in. from margin; secondary nerves and few transverse reticulations prominent; petiole very stout, '15 to '2 in. long. Racemes axillary, 4-flowered; pedicels very small, '1 in. long at most; bracts ovate-acute, like the rachis and calyx densely ferruginous-pubescent. Calyx-tube very short; lobes ovate, '075 in. long. Corollatube short; lobes '1 to '15 in. long, oblong-obtuse. Stamens about 30, slightly exsert. Ovary 3-celled; disk fulvous-pilose. Fruit not known. Brand Monog. Sympl. 52.

MALACCA: on Mount Ophir, Maingay (K.D.) 960.

19. Symplocos penangiana, King & Gamble, n. sp. A small tree (?): branchlets rounded, upper ones and innovations densely dark ferruginous-hirsute. Leaves chartaceous; lanceolate, long acuminate at apex, somewhat rounded at base; glabrous above, sparsely pilose beneath with long stiff ferruginous hairs especially on and along the nerves; greenish-brown when dry; margins distantly but sharply serrate in the middle part, entire on the acumination and near the base, revolute; 4 to 7 in. long, 1 to 1.25 in. broad; midrib prominent beneath, impressed above; main-nerves 4 to 6 pairs, irregularly distant, curving upwards and meeting about 2 in from the margin in a looped intramarginal nerve; secondary nerves and transverse reticulations scanty but prominent; petiole short, 15 in. long, stout, hirsute. Inflorescence a sessile very short raceme or panicle of flowers on the young branches; bracts several, very small, densely rusty-hirsute. Calyx-tube short; lobes 5, oblong, obtuse, 125 in. long, glabrous within, densely rusty-hirsute without. Corolla-tube short; lobes 5, oblong, rounded, 2 in. long. Stamens about 30; filaments slender; anthers rounded. Ovary villous; style slender, pubescent, 15 in. long; stigma capitate. Fruit unknown.

Penang: at West Hill, 2,500 feet, Curtis 325.

20. Symplocos cerasifolia, Wall. Cat. 4434 (1829). A tree, reaching 60 feet and even 80 feet in height; stem with a diam. of 20 in.; branchlets glabrescent, smooth, somewhat angled, reddish-brown; leaf-

buds nearly globose, scales rounded, acuminate. Leaves coriaceochartaceous; oblong or elliptic-oblong, acuminate at apex, cuneate or attenuate at base; glabrous above, sparsely pilose on the nerves beneath otherwise glabrous, dark greenish-brown when dry; margins crenately serrate except at the very base and on the acumination, slightly recurved; 5 to 7 in. long, 1 to 2 in. broad, midrib slender, impressed above; main-nerves 6 to 8 pairs, conspicuous, at once curving upwards and round to join each other in a well-marked looped ring 2 to 3 in. from the margin; reticulations transverse; petiole 5 to 7 in. long, slender, channelled above. Inflorescence of axillary and sub-terminal pubescent spikes; the rachis stout, angular; bracts broad, round, villous, early caducous; bracteoles 2, ovate-acute, 075 in. long, villous; flowers about 12 in each spike. Calyx-tube short, 05 in. long; lobes lanceolate, acute, pilose, 125 in. long. Corolla-tube short; lobes oblong-acute, 3-nerved, 2 in. long. Stamens about 30, or very numerous—over 100 (Scortechini), on the corolla-tube, fascicles not well separated; filaments very slender; anthers rounded, very minute. Ovary and disk slightly hairy; style slender, curved, 2 in. long, stigma capitate; cells 3, ovules 2 to 3 in each cell. Fruit a cylindric oblong drupe 1.5 to 2 in. long, 1 in. broad, truncate at both ends and tipped above by the persistent calyx-tube and lobes, the rim about 2 in. broad; smooth, yellowish-brown; exocarp thick, corky; endocarp woody with 7 to 8 sharp star-like ridges. Seed 1, testa membranous; albumen thin, embryo straight, pendulous; radicle long. A. DC. Prod. VIII. 257; Clarke in Hook. f. Fl. Br. Ind. III. 580; Mig. Fl. Ind. Bat. I. Pt. 2. 466; Brand Monog. Sympl. 52. Bobua cerasifolia, Miers in Journ. Linn. Soc. XVII. 304.

Penang: Wallich 4434; Curtis 1503, 3096. Perak: Wray 445, 3003; Scortechini 515; King's Collector 6283, 6950. Malacca: Maingay (K.D.) 962

Scortechini considered his No. 515 to represent a species separate from S. cerasifolia, but with a large series of specimens before us we find it difficult to agree to this.

21. Symplocos rigida, Clarke in Hook. f. Fl. Br. Ind. III. 581 (not of Wall.) (1882). A tree with spreading branches, reaching 60 to 80 feet in height and 18 to 24 in. in diam. of stem; branchlets stout, dark brown, glabrous, angled when dry, marked with the prominent round raised scars of fallen leaves; branch-buds large, covered with oblong glandular-serrate stipular scales, softly silky on the back; leaf-buds acuminate, 3 to 5 in. long, silky-pubescent. Leaves coriaceo-chartaceous; oblong or oblong-lanceolate, acute or shortly acuminate at apex, attenuate at base; glabrous on both surfaces

and usually shining, dark greenish-brown when dry; margins entire or very shortly serrate, recurved when dry; 6 to 12 in. long, 2.5 to 5 in. broad; midrib stout, much raised beneath, impressed above; main-nerves 10 to 13 pairs, raised beneath, curving upwards to and along the margin; secondary nerves few or none; reticulations transverse, parallel, not prominent; petiole '7 to 1.3 in. long, stout, glabrous. Inflorescence of simple spikes, strobilate when young and scarcely 5 in. long, in flower 1.5 to 2 in. long with pubescent rachis, in fruit reaching 3 in. long with stout nearly glabrous rachis, in the axils of upper leaves or the young branchlets below them; bracts broadly ovate, acute, concave, minutely grey or tawny-pubescent; bracteoles 2, lanceolate-acute, 1 in. long, all early deciduous; buds ovoid, grey-pubescent. Calyx-tube 075 in. long; lobes 4, ovate-acute, blunt, 1 to 15 in. long, both grey-pubescent. Corolla-tube short, lobes 5, white, oblong, acute, 25 in. long, 5-nerved. Stamens in 5 bundles opposite the corolla-lobes, about 60; filaments very slender, outer ones longer than corolla-lobes; anthers rounded, minute. Ovary and disk glabrous; style curved, 25 in. long, stigma capitate; cells 3, ovules 2 in each cell. Fruit ovoid-oblong, 1 to 1.5 in. long, 75 to 1 in. broad, waxy greenish-white when half ripe, dark blue when ripe; pale brown, shining, smooth, obscurely angled when dry; surmounted by the calvx-rim 15 in. broad with erect calvx-teeth; exocarp thick, fleshy; endocarp very hard, woody, with 8 sharp star-like ridges; cells 3. Seeds 1 to 3, testa thin fibrous, albumen fleshy, embryo straight, radicle long. Brand Monog. Sympl. 52. Doxomma rigidum, Miers in Trans. Linn. Soc. Ser. 2. Bot. I. 104. Barringtonia rigida, Clarke in Hook. f. Fl. Br. Ind. II. 510.

Perak: Wray 1294, 3207; Scortechini 2046; King's Collector 4246, 4277, 4613, 5045, 5048, 6095, 6179, 7260, 7898, 8543, 10013. Selangor: Ridley 10544. Malacca: Maingay (K.D.) 767, 965. Singapore: Cantley 50; Ridley 1798, 5960.

22. Symplocos rubiginosa, Wall. Cat. 4432 (1829). A large shrub or a tree sometimes reaching 70 to 100 feet in height and 15 to 20 in. or more in diam. of stem; branches stout, grey, nearly glabrous; branchlets stout, angled, glabrous or cinnamomeous- or ferruginous-hirsute; leaf-buds lanceolate, 3 to 4 in. long. Leaves coriaceo-chartaceous; obovate-oblong, acute or shortly and abruptly acuminate at apex, cuneate at base; glabrous above, pubescent especially on the nerves beneath, the pubescence pale rusty-brown, pale greenish-brown when dry; margins shortly dentate especially on the upper half, sometimes nearly entire, recurved; 5 to 11 in. long, 2 to 4 in. broad; midrib stout, prominent beneath, impressed above; main-

nerves 10 to 13 pairs, parallel, very prominently raised beneath and usually impressed above. curving upwards to and along the margin; secondary nerves few or none: reticulations many, prominent, transverse, parallel: petiole thick, densely pubescent, 5 to 1 in, long. Inflorescence of simple erect spikes, from the axils of upper leaves or from the young branchlets below them; spikes 1 to 2 in. long. softly cinnamomeous-pubescent, the rachis stout especially in fruit; flowers about 12 to 16 in each spike, each flower supported by a broad ovate rounded bract 175 in, long and two ovate-acute bracteoles 1 in. long. Calux-lobes ovate-lanceolate, acute, 06 to 07 in. long; tube as long as lobes. Corolla-tube short, lobes white, oblong, 15 in. long, 3-nerved, glabrous. Stamens in 5 bundles opposite to the corolla-lobes, usually about 30: filaments unequal, the outer ones longer than the corolla-lobes: anthers minute, round. Ovary and disk glabrous, style slender, about 15 in. long, stigma capitate or lobed; cells 3. Fruit an ovoid-oblong drupe, 4 in. long, 25 in. broad, surmounted by the calyxrim 1 in, in diam, pale brownish-vellow when dry, glabrous or softly pilose: exocarp thin, crustaceous, fragile; endocarp woody, faintly ridged; seeds usually 3. A. DC. Prod. VIII. 257; Miq. Fl. Ind. Bat. I. Pt. 2. 466; Clarke in Hook. f. Fl. Br. Ind. III. 580; Brand Monog. Sympl. 53. Lodhra rubiginosa, Miers in Journ. Linn. Soc. XVII. 299

Penang: Wallich 4432; Curtis 528, 1692; G. King. Perak: Scortechini 1825; King's Collector 5192, 5771, 7112, 8105, 10015, 10021. Malacca: Maingay (K.D.) 955; Griffith (K.D.) 3652. Johore: Ridley 11115. Singapore: Cantley 72; Ridley 4117.—Distrib. Sumatra (Forbes 1991), Borneo (Beccari 1216, Haviland 1679, 3480).

Subgenus II.—Cordyloblaste.

23. Symplocos confusa, Brand Monog. Sympl. 88 (1901). A shrub, 5 to 8 feet high (Lobb); branchlets rough, dark brown, marked with prominent cushion-like scars, uppermost ones and innovations ferruginous-pubescent. Leaves chartaceous; variable in shape, elliptic-oblong to ovate-lanceolate bluntly acute at apex, attenuate often unequally at base; margins entire or slightly undulate, recurved; glabrous on both surfaces; 3 to 4 in. long, 1·5 to 2 in. broad; midrib slender; main-nerves irregular, about 6 pairs; secondary nerves and reticulations also irregular, indistinct; petiole ·2 to ·3 in. long, slightly pubescent. Inflorescence of very short, 1–4-flowered, axillary, grey-silky racemes about ·25 in. long; bracts very small, ovate-acute; bracteoles also minute, 2 to each pedicel; pedicels ·05 to ·1 in. long; flowers white, sweet-scented. Calyx-tube

campanulate, grey-silky, '1 in. long; lobes 5, short, rounded, ciliate. Corolla-tube funnel-shaped, '2 to '3 in. long, glabrous; lobes 5, oblong, obtuse, spreading, '15 in. long. Stamens very many (40 to 60), inside a staminal tube somewhat longer than the corolla-tube; filaments very short, slender; anthers small, rounded. Ovary and disk villous; style slender, hirsute or glabrescent, '3 to '5 in. long; stigma large, capitate. Fruit not known. S. Henschelii, Benth. & Hook. f. ex Clarke in Hook. f. Fl. Br. Ind. III. 588; Forbes & Hemsl. in Journ. Linn. Soc. XXVI. 73.

MALACCA: on Mount Ophir, Griffith (K.D.) 3644; Lobb; Maingay (K.D.) 954.—DISTRIB. Borneo (Beccari 2405), China.

This species, which in the Fl. Br. Ind. was placed under S. Henschelii, has been separated by Brand, who considers the true S. Henschelii (Cordyloblaste Henschelii, Moritzi in Bot. Zeit. vi. 604 (1848), to be a Java plant only. It is not thought necessary to maintain Clarke's var. hirtistylis.

24. Symplocos Maingayi, Benth. ex Clarke in Hook. f. Fl. Br. Ind III. 588 (1882). A tree with spreading branches reaching 40 to 60 feet in height and 10 to 15 in. in diam. of stem; branches stout, light brown; branchlets and innovations densely ferruginous-velvetypubescent. Leaves chartaceous; elliptic-oblong, shortly acuminate at apex, broadly attenuate or rounded at base; glabrous or with a few scattered hairs above, sparsely pubescent beneath except the nerves which are hirsute, marked also beneath by numerous faint transverse lines: margins entire: 4 to 6 in. long, 2 to 2.5 in. broad: midrib stout, very prominent beneath, impressed above; main-nerves 8 pairs, curving upwards and joining in a looped intramarginal nerve, impressed above; secondary nerves few and with the reticulations rregular; petiole 3 to 5 in. long, stout, densely ferruginouspubescent. Inflorescence of stout densely ferruginous-pubescent racemes, 1 to 1.5 in. long, bearing about 8 to 10 flowers, in the axils of the upper leaves; bract 1, ovate, acute, 2 in. long; bracteoles 2, similar but smaller; pedicels stout, 1 to 15 in. long. Calyxtube campanulate, densely rusty-pubescent; teeth 5, rounded, 05 in. long. Corolla-tube narrow funnel-shaped, 1 to 1.5 in. long, densely white-tomentose without; lobes 5 in. long, oblong, reflexed. Staminaltube adnate to the corolla-tube as far as the lobes, then free above it; top of tube truncate, 15-20-lobed, the lobes separable as ligules; stamens inserted irregularly on the tube and lobes, about 40 to 60; free part of filaments short, slender; anthers ovoid. Ovary and disk hairy; style slender, as long as corolla-tube, stigma capitate; cells 3. Fruit obovoid, obtuse, glabrous, 1.75 in. long, 1.25 in. broad, crowned

with the remains of the calyx-rim ·125 in. wide, pericarp very thick, woody. Brand Monog. Sympl. 90.

PERAK: King's Collector 6728. MALACCA: Maingay (K.D.) 961.

25. Symplocos Scortechinii, King & Gamble, n. sp. A tree (?); branchlets pale brown, slender, scurfy; innovations sparsely greypubescent. Leaves chartaceous; oblong-lanceolate, attenuately bluntacuminate at apex, cuneate at base; glabrous on both surfaces dark brown when dry, margins entire; 4 to 5 in. long, 1.5 to 2 in. broad; midrib slender, raised beneath, impressed above; main-nerves 8 to 10 pairs the lowest close to the margin, the others curved upwards to meet in a looped intramarginal nerve; secondary nerves many and, with the reticulations, irregular, fairly prominent; petiole 5 in. long, channelled above, slightly pubescent when young. Inflorescence of axillary or pseudo-terminal racemes, '7 to 1 in. long, sometimes giving the appearance of a terminal panicle; rachis grey-pubescent, angular; bract and 2 bracteoles lanceolate-acuminate, ·1 to ·15 in. long; pedicels ·2 in. long. Calyx-tube campanulate, 2 in. long, grey-pubescent without, as are the rounded obtuse .05 in. long teeth. Corolla-tube slender, funnel-shaped, 1 to 1.5 in. long, densely white-tomentose without; lobes 5 in. long, oblong-obtuse, much imbricate in bud. Staminal-tube adnate to the corolla-tube as far as the lobes, then free above it, top of tube truncate, about 15-lobed, the lobes separable as ligules; stamens inserted irregularly on the tube and lobes, about 40 to 50; free part of filaments short, slender; anthers rounded. Ovary and disk hairy; style slender, as long as corolla-tube, stigma capitate; cells 3, ovules 2 in each cell. Fruit obovoid-oblong, obtuse, glabrous, 1.75 in. long, 1.2 in. broad, crowned with the remains of the calyx-rim 1 in. in diam.; pericarp thick, corky; seed 1.

PERAK: Scortechini.

This species comes very near to S. Maingayi in respect to its flowers and fruit, but the branches are much more slender, the dense ferruginous tomentum is absent, and the leaves are different, so we have no hesitation in describing it as a new species.

The following Bornean species seems worthy of description here: it may possibly be found also in the Peninsula:—

Symplocos Hayllandi, King & Gamble, n. sp. A small tree (?); branchlets stout, somewhat flattened, yellowish-brown; leaf-buds conical, glabrous. Leaves coriaceous; elliptic, abruptly acuminate at apex, acute at base; glabrous on both surfaces, orange-brown when dry; margins entire, recurved; 3 to 4 in. long, 1.25 to 1.75 in. broad; midrib stout, impressed above; main-nerves 7 to 8 pairs, the lowest pair near the margin and more acutely angled (about 45°) than the others, straight at first at an angle of 60°, then curved to meet in a widely looped intramarginal nerve, prominently raised above when dry; secondary-nerves and reticulations also raised; petiole '4 to '5 in. long, stout, rough, the upper half winged by the decurrent margin of the blade. Inflorescence a nearly sessile, few-branched panicle of racemes, about 1.5 in. long;

flowers about 12; rachis glabrous, flattened; bracts and bracteoles minute, caducous; pedicels none or very short, scarcely 05 in. long; buds globose. Calyx-tube 05 in. long; lobes orbicular, ciliate, as long as tube. Corolla-tube very short; lobes 5, 15 in. long, ovate-oblong, ciliate. Stamens about 50, in 5 bundles of about 10 each, opposite the corolla-lobes; anther-cells orbicular; filaments slender, the longest as long as the petals. Ovary conical, glabrous; style slender, 1 in. long, stigma capitate. Fruit not known.

BORNEO: in Sarawak, near Kuching, Haviland No. 1954.

2. STYRAX, Linn.

Trees and shrubs, usually more or less lepidote or stellate-tomentose on all parts except the upper-surface of the leaves, rarely glabrous. Leaves various in shape, entire or serrulate. Flowers generally white, in lax axillary or terminal, simple or compound, often pendulous racemes; bracts very small. Calyx campanulate, free or slightly adnate to the base of the ovary, truncate or 5-toothed. Corolla-tube short; lobes 5, erecto-patent, elliptic-oblong, imbricate or valvate. Stamens 10. 1-seriate at the base of the corolla-tube; filaments more or less flattened, continuous with the connective; anthers large, linear, the cells parallel, erect. Ovary nearly free, at first 3-celled, later often 1-celled; style subulate; stigma capitate, somewhat 3-lobed; ovules few in each cell, in free ovaries nearly all erect from the lower basal angle, in halfadnate ovaries upper pendulous lower erect. Fruit globose or ellipsoid, seated on the cupuliform or patelliform calyx, breaking up irregularly. Seeds 1 or rarely 2 or more, integuments 2, the outer chartaceous or hardened, the inner membranous; albumen fleshy, copious; embryo straight, axile or excentric; cotyledons broad, with a longish terete radicle.—DISTRIB. Warmer regions of Asia and America. a few extending to temperate Asia and South Europe, species about 60.

Leaves green beneath, slightly stellate-pubescent ... 1. S. serrulatum.

Leaves white or greyish-white beneath, with occasional rusty-stellate hairs:—

Leaves small, under 5 in. long and 2·5 in. broad; calyx about one-third of the length of the corolla 2. S. Benzoin.

Leaves large, over 5 in. long and 2·5 in. broad; calyx about half of the length of the corolla 3. S. crotonoides.

1. Styrax serrulatum, Roxb. Fl. Ind. II. 415 (1832). A shrub or small tree, reaching 50 feet in height; branches slender, branchlets stellately grey-pubescent. Leaves membranous; ovate or ovate-lanceolate, acuminate at apex, rounded or cordate, sometimes acute at base; nearly glabrous above, glabrescent beneath, but with stellate hairs on both sides of the nerves; margins sparingly and irregularly serrate, sometimes sub-

entire, slightly revolute: 1.5 to 5 in, long, 1 to 2 in, broad: midrib slender; main-nerves 6 to 8 pairs, curving upwards and anastomosing near the margin; secondary nerves and reticulations prominent, the latter transverse: petiole 2 in. long, stellate-pubescent. terminal or from the axils of the uppermost leaves of the branchlets. 6-8-flowered or fewer, sometimes reduced to 1 only, sometimes paniculate from the absence of leaves, 1 to 2 in. long; rachis slender, densely white-stellate-pubescent: pedicels 2 in, long; bracteoles linear, nearly as long as pedicels: flowers white. Calux campanulate; tube whitepubescent without, glabrous within, 15 in. long; teeth 5, 05 in. long, irregular, repand-dentate, white-pubescent on both sides. Corolla-tube ·15 in. long, cylindric; lobes 5, ·25 in. long, oblong, sub-acute, densely white-pubescent without and within except the lower part of the tube. Stamens 10. 2.5 in. long: filaments inserted on the corolla-tube, wide and white-tomentose at the base, narrower and glabrous above, continued in the connective; anthers broadly linear, erect, as long as the filaments, rounded at top, cells 2 parallel. Ovary densely white-villous; style slender. 3 in, long; stigma small, capitate; cells 3. Fruit ellipsoid, 4 to 5 in. long, 3 in. broad, white- or grev-pubescent, supported by the patelliform calyx; pericarp fleshy, rather thin, irregularly breaking up. Seeds 1, rarely 2 or more; outer integument smooth, hard, shining, brittle: inner one membranous, brown; albumen firm, grey; embryo erect, nearly as long as the endosperm; cotyledons cordate, 15 in. long; radicle thick, terete, as long as cotyledons. Cat. 4402; A. DC. Prod. VIII. 267; Hook. f. in Bot. Mag. t. 5950 (syn. excl.); Kurz in Journ. As. Soc. Beng. XLVI. ii. 237 and For. Fl. II. 142; Clarke in Hook. f. Fl. Br. Ind. III. 588; Prain Beng. Plants I. 656. S. Porterianus, Wall. Cat. 4401; A. DC. l.c.; Mig. Fl. Ind. Bat. I. Pt. 2, 463. S. floribunda, Griff. Notul. IV. 287.

Penang: Wallich 4401; Phillips; Curtis 1187, 1538; Ridley 7176. Perak: King's Collector 1662.—Distrib. India, at 3,000 to 7,000 feet from Nepal to Assam, Chittagong and Burma.

The plant is frequently affected by galls.

2. Styrax Benzoin, Dryand. in Phil. Trans. Vol. LXXVII. 308, t. 12 (1787). A tree with slender drooping branches, reaching 60 to 80 feet in height and 2 to 3 feet in diam. of stem; branches rounded, glabrous; upper branchlets rusty-grey-stellate-pubescent. Leaves chartaceous; elliptic, acuminate at apex, attenuate or rounded at base; glabrous above, densely grey-stellate-pubescent beneath; margins entire or rarely slightly denticulate; 4 to 5 in. long, 1.5 to 2.5 in. broad; midrib slender, prominent beneath, impressed above; main-nerves 6 to 8 pairs, curving

upwards to and along the margin; reticulations transverse, regular, prominent; petiole 3 to 5 in. long, channelled above, densely grey-stellatepubescent. Racemes paniculate, terminal or axillary to the upper leaves. grey-stellate-pubescent; bracts ovate, caducous; pedicels slender, angular, 1 to 2 in. long; bracteoles linear, as long as the pedicels or nearly so; flowers silvery-white. Calyx cupular, 15 in. long, densely grey-stellate-pubescent without; teeth 5, minute. Corolla-tube 15 in. long, cylindric; lobes 5, 3 in. long, oblong-linear, acute, white-pubescent without and more or less within, recurved. Stamens 10, 3 in long, attached to the tube of the corolla; filaments flattened, 15 in. long, white-pubescent, continued in the connective; anthers linear. slender, erect, acute at tip, as long as filaments, cells parallel. Ovary conical, villous above; style slender, 3 in. long; stigma small, capitate; cells 3, ovules 2 or more in each cell, placentas central. Fruit depressedglobose, variable in size, reaching 8 in. in diam. and 6 in. in height; white-pubescent, supported by the flattened persistent patelliform calvx; pericarp corky, rather thick, irregularly dehiscing. Seed usually 1, pale-brown with a broad basal hilum; outer integument hard, brittle, inner membranous; albumen firm; embryo horizontal or oblique, nearly as long as the endosperm; cotyledons flattened, oblong-cordate, ·2 in. long; radicle smooth, ·15 in. long, cylindric. Blume Bijdr. 671; Roxb. Fl. Ind. II. 416; A. DC. Prod. VIII. 260; Bentl. & Trim. Med. Pl. III. t. 169; Mig. Fl. Ind. Bat. I. Pt. 2, 463; Clarke in Hook. f. Fl. Br. Ind. III. 589; Gürke in Engl. & Prantl Pflanzenfam. IV. i. 178, fig. 93; Koord. & Val. Bijdr. VII. 132.

Perak: Wray 808, 1208; Scortechini 1998; King's Collector 4459, 7840, 7884, 8615, 10203, 10305. Malacca: Maingay (K.D.) 963, 964; Griffith (K.D.) 3668. SINGAPORE: Ridley 2650.—DISTRIB. Sumatra (Beccari 699; Forbes 3120A); Java (Forbes 1183).

This species gives the gum "Benzoin," or "Benjamin," of commerce. The plant is often affected by galls, causing curious tassel-like excrescences on the branches. The tree has the odour of violets (Wray).

3. Styrax crotonoides, Clarke in Hook. f. Fl. Br. Ind. III. 589 (1882). A tree, 60 to 80 feet high and 15 to 20 in. in diam. of stem; branches spreading and drooping; branchlets rather thick, grey, ultimate ones and innovations densely clothed with whitish-grey and rusty-stellate tomentum, the rusty hairs large and scattered among the rest. Leaves chartaceo-coriaceous; broadly oblong or elliptic-oblong, abruptly acuminate at apex, attenuate or cuneate at base; glabrous above except on the nerves, densely white-tomentose beneath, and with scattered rusty-stellate hairs; margins entire or undulate; 5 to 7 in. long, 2.5 to

4 in. broad; midrib prominent beneath, impressed and stellate-pilose above; main-nerves about 10 pairs, prominent, arched upwards to and along the margin; reticulations prominent, transverse; petiole ·3 to ·4 in. long, stellate-pubescent. Racemes in terminal and axillary panicles, 4 to 8 in. long, densely white-tomentose and rusty-stellate-pilose, including calyx; pedicels very short, 0 to 15 in. long; bracts oblonglanceolate, glandular-dentate, 25 in. long; bracteoles 2, linear-subulate, ·15 in. long; flowers creamy-white. Calyx-tube cupular, ·2 to ·25 in. long, truncate; teeth 5, very minute. Corolla-tube short, 15 long, glabrous at the very base, appressed white-pubescent above; lobes 5, valvate, ·3 in. long, linear-oblong, acute, afterwards recurved. Stamens 10, about 3 in. long; filaments short, flat, glabrous, continued in the connective which is white-pubescent on the back; anthers 2 in. long, linear, mucronate, cells parallel. Ovary 5-lobed, white-villous, conical; style slender, as long as corolla; stigma capitate; cells 3, ovules 5 to 6, erect. Fruit ovoid, grey-pubescent, mucronate, 75 to 1 in. in diam., supported by the cupuliform calyx; pericarp thick, corky. Seed 1, outer integument pale brown, smooth, crustaceous, with a broad basal hilum, inner integument membranous; albumen firm, endosperm cushion-like; embryo somewhat oblique; cotyledons cordate, 2 in. long; radicle thick, terete, as long as cotyledons. Crotoni affinis sp. Wall. Cat. 7348.

Perak: Scortechini 179; King's Collector 7775, 7967, 8558, 10734. SINGAPORE: Wallich 7848; Cantley 60.

This species, like the others, is also frequently found with large tassel-like insect galls in place of the inflorescence.

Order LXXIV. OLEACEÆ.

Erect or climbing shrubs or trees, unarmed. Leaves usually opposite, rarely alternate or verticillate, simple or pinnately 3-few-foliolate, entire or toothed; stipules none. Inflorescence sometimes dichotomously cymose and centrifugal, sometimes trichotomously paniculate, some or all branches centripetal; cymes or panicles axillary or terminal. Flowers hermaphrodite, often dimorphous, sometimes polygamous or diecious, regular. Calyx free, usually small, campanulate, 4- or more-toothed or -lobed, rarely 0. Corolla gamopetalous; tube long or short; lobes or petals 4 to 12, imbricate or induplicate-valvate in bud. Stamens usually 2, sometimes 4, inserted on the corolla, or hypogynous if the petals are free or 0; filaments usually short; anthers rather large, ovate or oblong, rarely linear, dehiscing on the margin. Ovary free, 2-celled; style short or long; stigma simple or 2-lobed; ovules 1 to 2, rarely more, in each cell, attached to the inner angle near

the apex or base. Fruit capsular, loculicidally 2-valved or indehiscent, or a berry or drupe. Seeds solitary or 2 in each cell, erect or pendulous; testa thin or bony; albumen fleshy or horny or 0; embryo straight; radicle inferior or superior.—DISTRIB. Tropical and temperate regions of the world; genera about 18, species about 280.

Corolla-lobes imbricate :--

Seeds exalbumin	nous; usually climbin	ig shrubs	••	1	. Jasminum.
Seeds albuminou	us; small trees	• •	• • •	2	. OSMANTHUS.
Corolla-lobes valva					
Dadiele amonion	. tugos or arout about	~ .			

Radicle superior: trees or erect shrubs:—

Corolla-tube very short, petals often in pairs	• •	3.	LINOCIERA.
Corolla tubular, sometimes absent		4.	OLEA.
Radicle inferior; climbing shrubs		5.	MYXOPYRUM.

Nyctanthes Arbor-tristis, Linn., is found in gardens in cultivation.

1. Jasminum, Linn.

Erect or climbing shrubs. Leaves opposite or rarely alternate, simple trifoliolate or imparipinnate, generally entire; petiole usually articulate. Flowers often handsome, white pink or yellow, often sweet-scented, in 2- or 3-chotomous or simple cymes or sometimes solitary, axillary or terminal, inflorescence centrifugal; bracts linear and small or ovate, sometimes petaloid, bracteoles usually linear. Calyx-tube usually funnel-shaped or campanulate; lobes 4 to 9, linear, long or short or 0. Corolla-tube narrow, more or less elongate; lobes 4 to 9, spreading, much imbricate. Stamens 2, usually included in the corolla-tube; filaments short; anthers oblong, attached to the filaments at the back near the base, cells parallel, connective broad, usually produced in a mucronate point. Ovary 2-celled; ovules usually 2 in each cell, attached near the base; style filiform, long or short, often both in different flowers on the same plant; stigma oblong or capitate, generally bifid. Berry didymous or simple by suppression of one carpel; carpels globose, ellipsoid or elongate, pericarp usually of two layers, the outer (exocarp) membranous, the inner (endocarp) fleshy or fibrous. Seeds usually 1 in each carpel, sometimes 2, testa very thin; albumen none; cotyledons plano-convex; radicle inferior, very small, included within the cotyledons or slightly exsert.—DISTRIB. Tropical and warm temperate regions of Asia, Africa, and Australia, one species in Europe, many in cultivation: about 90 species in all.

Leaves penninerved, basal pair of nerves not opposite nor produced to form an intramarginal nerve:-

Inflorescence terminal:-

Erect or straggling shrub

.. 1. J. Sambac.

Climbing shrubs :—		
Calyx-lobes ·2 in. long or longer; leaves rather large :-		
Leaves chartaceous:—		
Leaves and branchlets fulvous-pilose, main-nerves		
10 to 12 pairs		J. Griffithii.
Leaves and branchlets glabrous, main-nerves 6 to		
8 pairs	3.	J. Maingayi.
Leaves membranous:—		
Calyx-lobes spreading, 25 in. long or longer; fruit-		
ing pedicels thickened	4.	J. Wrayi.
Calyx-lobes erect, 5 in. long; pedicels very short	5.	J. Curtisii.
Calyx-lobes under ·2 in. long, pubescent; leaves		
small:—		
		J. decussatum.
Corolla-tube 6 to 8 in. long	7.	J. bifarium.
Inflorescence axillary	8.	J. adenophyllum
Leaves penninerved, basal pair of nerves opposite, produced to		
form an intramarginal nerve:—		
Basal pair of nerves prominent, branchlets round:—		
Flowers in few-flowered long-peduncled cymes; pedicels		
	9.	J. longipetalum.
Flowers in many-flowered short-peduncled cymes; pedi-		
		J. smilacifolium.
Basal pair of nerves not prominent, branchlets 4-angular		
Leaves 3-foliolate	12.	J. Scortechinii.

1. Jasminum Sambac, Ait. Hort. Kew. I. 8 (1789). A sub-erect, straggling, scarcely climbing shrub; branches terete, smooth; branchlets slender, pubescent. Leaves membranous; variable, usually ovate, often broadly so, acute or obtuse at apex, cuneate or rounded or cordate at base; glabrous above, pubescent on the nerves beneath, often with tufts of hair in the axils of the main-nerves; margins recurved; 1.5 to 4.5 in. long, 1 to 2.5 in. broad; midrib slender, impressed above, raised beneath; main-nerves 4 to 6 pairs, arching upwards to and along the margin, raised beneath; reticulations distinct on both sides: petiole 1 to 25 in. long, pubescent, articulate in the middle. Flowers white, very fragrant, solitary or in 2-3-flowered terminal pubescent cymes; bracteoles linear-subulate; pedicels 25 in. long, pubescent. Calyx-tube campanulate, 1 in. long; teeth 5 to 9, linear-subulate, 1 to ·25 in. long. Corolla-tube slender, funnel-shaped, ·5 in. long; lobes 8 to 9. spreading, as long as tube, oblong acute or obtuse. Stamens included in the tube; filaments short; anthers oblong. Ovary rounded; style slender; stigmas 2, clavate. Berry didymous or with 1 carpel only by suppression; carpels black, 25 in. in diam., sub-globose, surrounded by the sub-erect persistent calyx-teeth. Bot. Reg. t. 1; Bot. Mag. t. 1785; Wall. Cat. 2868; A.DC. Prod. VIII. 301; Wight Ic. t. 704; Dalz. & Gibs. Bomb. Fl. 137; Brandis For. Fl. 311; Kurz in Journ. As. Soc.

Beng. XLVI. ii. 242, and For. Fl. II. 153; Clarke in Hook. f. Fl. Br. Ind. III. 591; Blume Bijdr. 677; Miq. Fl. Ind. Bat. II. 542; Cooke Bomb. Fl. II. 111; Prain Beng. Plants 659. J. fragrans, Salisb. Prod. 12. J. undulatum, Willd. Sp. Pl. I. 36 (not of Ker). J. Zambac, Roxb. Hort. Beng. 2, and Fl. Ind. Ed. Carey & Wall. I. 87. J. quinqueflorum, Heyne; Wall. Cat. 2878; A.DC. l.c. 302. J. pubescens, Wall. Cat. 2880, not of Willd. Nyctanthes Sambac and undulatum, Linn. Sp. Pl. 8. Mogorium Sambac, Lamk. Dict. IV. 210; Ill. t. 6, fig. 1. M. undulatum, Lamk. Dict. IV. 212. "Kudda-mulla," Rheede Hort. Mal. VI. tt. 50, 51. Burm. Thes. Zeyl. t. 58, fig. 2.

Perak: Scortechini 997.—Distrib. India, Ceylon, Burma, Siam.

Much cultivated in India and in all tropical regions. The cultivated forms have many-flowered cymes and rounded corolla-lobes, and they are often found with double flowers.

2. Jasminum Griffithii, Clarke in Hook. f. Fl. Br. Ind. III. 593 (1882). A slender climbing shrub; branchlets densely and patently fulvous-villous. Leaves chartaceous; ovate- or elliptic-oblong, bluntly acute or acuminate at apex, rounded or cordate at base; fulvous-pilose on both surfaces, sparsely above, more densely beneath but glabrescent when old, the uppermost often whitened; 4 to 6 in. long, 1.5 to 3.5 in. broad; midrib prominent beneath; main-nerves 10 to 12 pairs, at first straight then arching upwards to join in a prominent looped intramarginal nerve; secondary nerves few; reticulations rather indistinct; midrib and all nerves impressed above and pilose, raised and densely fulvous-villous beneath, tufted in the axils; petiole stout, 2 to 4 in. long. Flowers creamy-white, in terminal, many-flowered, fulvouspilose cymes, 1 to 1.5 in. long and up to 2 in. broad; bracts leafy, lanceolate, about 5 to 1 in. long, few; bracteoles many, linear, similar to calyx-lobes, of various lengths. Calyx-tube slender, 1 in. long; lobes 5, linear, 2 in. long. Corolla-tube slender, slightly enlarged above, .75 in. long; lobes 5, spreading, 25 in, long, elliptic, apiculate; lobes and tube minutely pubescent without. Stamens included or slightly exsert; filaments broad; anthers oblong-lanceolate with a broad connective, 15 to 2 in. long. Ovary glabrous; style slender; stigma clavate. Berry didymous; carpels waxy-white, globose, 3 to 4 in. in diam., pericarp crustaceous, glabrous. Seed usually one, testa fibrous; cotyledons thick, plano-convex, 2 in. in diam.

Perak: King's Collector 10229. Malacca: Griffith (K.D.) 3704. Singapore: Ridley 8455.

VAR. cuspidata, King & Gamble. Leaves thinner than in the type, oblong, abruptly and sharply cuspidate-acuminate at apex, attenuate and

abruptly rounded at base, 5 to 5.5 in. long, 1.5 to 2 in. broad, much less pilose, main-nerves 8 to 10 pairs; seeds 1 to 2, testa crustaceous.

PENANG: Curtis 2787. MALACCA: Maingay (K.D.) 998. JOHORE: at Gunong Palai, 1,400 feet, G. King.

3. Jasminum Maingayi, Clarke in Hook.f. Fl. Br. Ind. III. 594 (1882). A climbing shrub; branchlets light brown, terete, internodes somewhat elongate, innovations and inflorescence tawny-pubescent. Leaves chartaceous; ovate or ovate-oblong, acuminate and often mucronate at apex, rounded or attenuate or cuneate at base; glabrous on both surfaces; margins recurved; 3 to 6 in. long, 2 to 2.5 in. broad; midrib stout; main-nerves 6 to 8 pairs, arching upwards to join in a looped intramarginal nerve about 2 in. from the margin; secondary nerves few: reticulations distant, obscure: all nerves strongly impressed above and raised beneath; petiole 5 to 7 in. long, articulate in the middle, twisted, the bases of each pair connected by a raised nodal line. Flowers in terminal or axillary, paniculate, tawny-pubescent, trichotomous cymes, 1.5 to 2 in. long, sessile or peduncled; bracts oblong or spathulate, leafy; bracteoles linear, about 25 in. long or less; pedicels blueish, 15 in. long; flowers white, sometimes slightly tinged with pink. Calyx-tube campanulate, .07 to .1 in. long; teeth 6, linearsubulate, 325 in. long. Corolla-tube slender, 5 to 7 in. long, glabrous; lobes 8 to 10, spreading, rotate, oblong-lanceolate, apiculate, 4 in. long, with prominent nerves. Stamens included in the corolla-tube; filaments slender, appressed to the tube; anthers oblong, mucronate, ·15 in. long, connective broad. Ovary cylindrical, glabrous; style slender, 4 to 5 in. long; stigma clavate. Fruit of one carpel, oblong, ·5 in. long, ·3 in. broad, exocarp thin shining, endocarp fibrous. Seeds 2, testa thin. Hook. f. Bot. Mag. t. 7823.

Penang: Maingay (K.D.) 1000; Curtis 643. Perak: Scortechini 139, 304; Curtis 2032; King's Collector 2761, 2762, 3975.—Distrib. Borneo (Haviland & Hose 911).

VAR. kedahensis, King & Gamble. Branchlets and inflorescence thickly rusty-pubescent. Leaves more ovate, rounded at base, nerves fewer, rarely 3 to 4 pairs, the two lower pairs very strong. Drupe nearly globose.

KEDAH: Ridley 5535.

A well-marked variety which may prove, when better known, to be a species.

4. Jasminum Wrayi, King & Gamble, n. sp. A slender climbing shrub; branchlets pale brown, slender, terete. *Leaves* membranous; oblong or obovate-oblong, acuminate at apex, attenuate or rounded, sometimes slightly auricled at base; glabrous on both surfaces except

for tufts of tawny hairs in the axils of the main-nerves beneath; 3 to 7 in. long, 1.5 to 2.5 in. broad; midrib very slender, raised beneath; mainnerves about 7 pairs, curving upwards to and along the margin where they are obscurely connected in an intramarginal looped nerve, usually slightly impressed above and raised beneath; secondary nerves and reticulations obscure; petiole 3 to 5 in., slender, twisted. Flowers cream-coloured, in terminal, about 15-20-flowered corymbose cymes 2 to 3 in. long; peduncle 1 to 1.5 in. long, branches at right angles to rachis in fruit, 7 to 1 in. long; bracts lanceolate-acuminate, 5 in. long; bracteoles linear-subulate, 2 to 3 in. long; pedicels slender in flower. clayately-thickened in fruit and then 3 to 5 in. long. Calyx-tube very short; lobes 5, linear-subulate, spreading, curved, 25 in. long, glabrous or slightly pilose. Corolla-tube slender, .75 in. long, slightly enlarged above; lobes 8 to 9, narrow, 3 to 4 in. long. Stamens included in the corolla-tube; filaments short; anthers oblong, long-mucronate. Ovary cylindric, depressed; style slender; stigma slightly clavate. Fruit didymous; carpels ovoid-globose, greenish-white, 25 to 5 in. long, exocarp thin shining, endocarp fibrous. Seed 1, testa very thin, membranous; cotyledons plano-convex, thick.

Perak: Wray 2297, 2905, 3147; King's Collector 1838, 2484.

VAR. hispida, King & Gamble. Upper branchlets and inflorescence including calyx sparsely hispid, also midrib and main-nerves of leaves beneath; under-surface of leaves often pubescent; main-nerves up to 10 pairs.

Perak: King's Collector 5893, on limestone hills. Selangor: Curtis 3774.

Var. axillaris, King & Gamble. Leaves rather small, sparsely pubescent, especially on the midrib and main-nerves; inflorescence axillary, few-flowered (5 to 7), calyx hispid; fruit large, up to ·5 in. in diam.

Perak: on Maxwell's Hill, 3,000 feet—a slender climber, Scorte-chini 273.

5. Jasminum Curtish, King & Gamble, n. sp. A climbing shrub (?); branchlets slender, terete, minutely rusty-pubescent. Leaves membranous; ovate or ovate-oblong, acuminate at apex, rounded at base; glabrous on both surfaces except for pubescence on the nerves above and tufts of hair in the axils of the main-nerves beneath; 3 to 5 in. long, 1 to 2 in. broad; midrib slender; main-nerves 5 to 6 pairs, distant, curving upwards and joining in a looped nerve 1 to 2 in. from the margin, raised and prominent on both surfaces; secondary nerves and reticulations few, irregular; petiole 4 in. long, pubescent, twisted, articulate in the middle, the bases of each pair connected by a faint

nodal line. Flowers in a terminal trichotomous rusty-pubescent cyme, supported by pale (white?) leafy, ovate-lanceolate, pubescent bracts 1 to 1·25 in. long; bracteoles similar but smaller; pedicels ·15 in. long; flowers in each cyme about 15 to 20. Calyx-tube campanulate, ·15 in. long; lobes 6, linear-subulate, ·5 in. long. Corolla-tube slender, cylindrical, 1 in. long; lobes 8 to 9, spreading or recurved, ·5 in. long, oblong-lanceolate, acute. Anthers oblong, ·125 in. long, mucronate. Ovary cylindric, glabrous; style slender; stigmas 2, clavate. Fruit not known.

PERAK: at Ipoh, Curtis.

A remarkable species, distinguished by the very long hair-like calyx-lobes and the coloured or white large leafy bracts and bracteoles.

6. Jasminum decussatum, Wall. Cat. 2860 (1829). A climbing shrub; branchlets slender, densely rusty-pubescent. Leaves chartaceous; ovate or ovate-lanceolate, acuminate at apex, rounded at base; sparsely pubescent above, more densely so beneath; 2 to 4 in. long, 1 to 1.5 in. broad; midrib rather stout; main-nerves 4 to 5, lowest pair obscure, rest curved upwards to meet near the margin, impressed above, raised beneath; petiole 3 to 4 in. long, pubescent, articulate near the base, the bases of each pair of petioles (as also branchlets) joined by a raised nodal line on either side. Flowers in densely pubescent axillary and terminal trichotomous corymbose cymes about 1 to 2 in. long, supported by a pair of large leaf-like bracts; bracteoles linear-subulate; pedicels 1 to 2 in. long. Calyx-tube short; teeth 6, subulate, 1 in. long. Corolla-tube slender, 25 in. long; lobes 8 to 9, as long as tube, oblong-lanceolate, apiculate. Stamens included in the corolla-tube; filaments short; anthers oblong, 1 in. long, mucronate. Ovary rounded, glabrous; style slender, longer than the corolla-tube (in short-stamened flowers); stigmas two, clavate. Fruit of one ellipsoid carpel, 2 to 3 in. long, glabrous. A.DC. Prod. VIII. 306; Kurz in Journ. As. Soc. XLVI. ii. 241, and For. Fl. II. 151; Clarke in Hook. f. Fl. Br. Ind. III. 596.

Penang: King's Collector 1425, at Trang, 100 to 300 feet.—DISTRIB. Burma (Wallich 2860, Griffith 3699).

7. Jasminum Bifarium, Wall. Cat. 2866 (1829). A climbing shrub; branchlets slender, terete, brown when dry, pubescent or nearly glabrous. Leaves chartaceous, usually bifarious; ovate or ovate-oblong, acuminate at apex, rounded or truncate sometimes almost cordate at base; pubescent or sometimes nearly glabrous on both surfaces; 2 to 3 in. long, 1 to 1.5 in. broad; midrib slender, pubescent, impressed above, raised beneath; main-nerves 4 to 6 pairs, pubescent, prominent beneath, arched upwards to join in an intramarginal nerve; secondary nerves and reticulations very obscure; petiole ·2 to ·3 in. long, twisted, articu-

late in the middle, the bases of each pair connected (as are the branchlets) on either side by a raised nodal line. Flowers white, in few- (4–12-) flowered, pubescent, sub-capitate cymes, sub-sessile in the axils of the two uppermost bract-like leaves; bracteoles linear-subulate, ·15 in. long; pedicels ·1 in. long. Calyx-tube campanulate; teeth 5 to 7, linear-subulate, ·1 to ·15 in. long. Corolla-tube slender, cylindric, ·6 to ·8 in. long; lobes 6 to 9, ovate-oblong, spreading, apiculate, ·2 to ·3 in. long. Stamens included in the corolla-tube; filaments short, slender; anthers oblong, mucronate, ·1 to ·15 in. long, connective broad. Ovary cylindric, glabrous; style slender, exsert; stigmas 2, clavate. Fruit a didymous berry; carpels ovoid, ·5 in. long, ·2 in. broad; exocarp membranous shining, endocarp fibrous. Seed conform to carpel, testa very thin, membranous. A.DC. Prod. VIII. 305; Clarke in Hook. f. Fl. Br. Ind. III. 595. J. bracteatum, Wall. Cat. 2867. J. nummularoides, Blume Mus. Lugd. Bat. I. 275; Miq. Fl. Ind. Bat. II. 537.

Penang: Wallich 2866, 2867; Curtis 1920; Ridley 9361. Perak: Wray 4180; King's Collector 860, 4920, 10699; Deschamps; Scortechini 59, 144, 238. Selangor: Ridley 7550, 8567. Pahang: Ridley in Trans. Linn. Soc., Ser. 2, III. 319.—Distrib. Java.

Var. glabra, Clarke in Hook. f. Fl. Br. Ind. III. 595. Leaves larger, elliptic, rhomboid or rounded at the base, more glabrous, less bifarious; calyx-teeth rather longer. J. Lessertianum, A.DC. Prod. VIII. 304.

Junkseylon (Tongka): Curtis 2911. Penang: Maingay (K.D.) 999; Deschamps. Perak: Wray 4180; Scortechini; Kunstler 122. Malacca: Griffith (K.D.) 3708; Goodenough 1995. Johore: Ridley 4217. Singapore: Lobb; Ridley 10760.—Distrib. Sumatra.

8. Jasminum adenophyllum, Wall. Cat. 2876 (1829). A very slender wiry climber; branchlets extensively twining, glabrous. Leaves membranous; ovate-lanceolate to elliptic-oblong, variable, acuminate and mucronate at apex, cuneate at base; glabrous above except on the midrib, glabrous beneath except the tuft of tawny hairs in the axils of the main-nerves; margins somewhat undulate; 1.5 to 5 in. long, .75 to 1.5 in. broad; midrib slender; main-nerves very slender, obscure, about 6 pairs, curving upwards to meet in a faint intramarginal looped nerve; petiole slender, twisted, articulate in the middle, .2 to .3 in. long, hispid. Flowers white, solitary, or 2 to 3 together in a slender, sometimes leafy, umbel from the axils of the leaves; peduncle .75 to 1.25 in. long, flattened above and with a pair of opposite bracts near the middle; bracts of umbel 2, linear-subulate, .3 in. long; pedicels very slender, .75 to 1 in. long, clavately enlarged in fruit. Calyx-tube campanulate, glabrous, ribbed, .1 in. long; lobes linear-subulate, keeled on the back,

sparsely hispid, '4 to '5 in. long, points recurved. Corolla-tube slender, funnel-shaped, '75 in. long; lobes as long or slightly longer, 8 to 9, recurved, oblong-ligulate, about '25 to '3 in. broad. Stamens included in the corolla-tube; filaments short, slender; anthers oblong, mucronate, '15 in. long, connective broad. Ovary cylindric; style slender; stigma clavate. Fruit globose, shining, young carpels '25 in. in diam. A.DC. Prod. VIII. 314; Clarke in Hook. f. Fl. Br. Ind. III. 597.

Penang: King's Collector 1736.—Distrib. Khasia Hills (Wallich).

This species is clearly quite a small climber, and while the Penang specimens have only small leaves those from the Khasia Hills show comparatively large ones, but this is not unnatural, and we believe the identification to be correct.

9. Jasminum longipetalum, King & Gamble, n. sp. A large climbing shrub, reaching 30 to 40 feet; branchlets slender, terete, pale brown. Leaves chartaceo-coriaceous, 3-nerved; elliptic, acute or shortly acuminate at apex, attenuate or cuneate or slightly rounded at base; glabrous on both surfaces; margins slightly recurved; 2 to 6 in. long, 1.5 to 3 in. broad; midrib slightly impressed above, shortly raised beneath; main-nerves 7 to 8 pairs, the basal pair opposite, at about 25° with the midrib produced in an intramarginal nerve about 25 in. from the margin, looped where the others, which are at about 65° with the midrib, join it; secondary nerves and reticulations very indistinct; petiole 2 to 4 in. long, twisted. Flowers white tinged with pink, fascicled 3 to 6 together in the axils of the upper leaves, forming sessile umbellate cymes; bracts very small, ovate-acute, deciduous; pedicels 1 to 1.5 in. long, very slender, summit enlarged in fruit. Calyx-tube short; lobes 6, glabrous, linear-subulate, 1 in. long, margins inflexed. Corolla-tube very slender, .75 in. long; lobes 9, linear-oblong, acute, 3-5-nerved, 75 to 1 in. long, much recurved in flower. Stamens within the tube; filaments short, slender; anthers oblong, 175 in. long, obtuse. Ovary glabrous, 2-celled; style slender; stigma flattened, minutely pubescent. Fruit didymous; carpel usually 1 only by suppression, black, globose, 4 to 5 in. in diam.; pericarp fleshy, glabrous. Seeds 2, testa very thin, cotyledons plano-convex.

Perak: King's Collector 2765, 6005—on rich soil at 300 to 800 feet elevation, scarce. Singapore: Ridley 10937.

A particularly handsome and well-defined species, which is well worthy of garden cultivation.

10. Jasminum smilacifolium, Griff. MS., Clarke in Hook. f. Fl. Br. Ind. III. 600 (1882). A large glabrous climbing shrub; branchlets pale brown, terete. *Leaves* coriaceous, 3-nerved; ovate, abruptly caudate-

acuminate at apex, obtuse or nearly cordate at base; margins entire, recurved; 5 to 7 in. long, 3 to 4 in. broad; midrib very prominent, impressed above, much raised beneath; two lowest main-nerves very prominent, similar to the midrib, curved upwards to form a pair of intramarginal nerves meeting at the apex; remaining main-nerves irregular, 3 to 4 pairs, inconspicuous; secondary nerves and reticulations raised above; petiole 75 in. long, twisted, articulate in the middle. Inflorescence of axillary 5-20-flowered cymes; rachis jointed, terete: bracts spathulate, 1 to 2 in. long; bracteoles smaller, linear; pedicels ·2 to ·3 in. long, greatly enlarged in fruit; flowers white, tinged with pink. Calyx campanulate, tube 15 in. long; teeth 5, 05 in. long. Corolla-tube slender, cylindrical, 75 to 1 in. long; lobes oblong, acute or apiculate, .75 in. long, .2 in. broad. Stamens inserted in the throat of the tube; filaments short; anthers linear-oblong, 25 in. long, mucronate. Drupe didymous; carpels ellipsoid, 1 in. long, 3 to ·4 in. broad, smooth, shining.

MALACCA: Griffith (K.D.) 3698; Maingay (K.D.) 997.

11. Jasminum insigne, Blume Mus. Bot. Lugd. Bat. I. 278 (1849). An extensively climbing shrub; branches obscurely quadrangular with pale-grey corky bark; branchlets acutely quadrangular, glabrous, the edges pale-corky-winged. Leaves chartaceo-coriaceous; opposite, occasionally whorled; elliptic or elliptic-oblong, acute at apex, cuneate at base; glabrous on both surfaces; margins recurved; 2 to 8 in. long, 1 to 4 in. broad; midrib slender, raised beneath; main-nerves 6 to 7 pairs, the basal pair faint, opposite, at about 30° with the midrib, produced in an intramarginal nerve 1 to 2 in from the margin, looped where the others, which are at 50° to the midrib, join it; secondary nerves and reticulations obscure; petiole '4 to 1.2 in. long, twisted, the upper part bordered for a short distance by the decurrent margins of the blade. Flowers white, in compact, many-flowered, glabrous cymes from the axils of the leaves or (more usually) from the stem; bracteoles subulate, 1 to 15 in. long, caducous; pedicels stout, 2 in. long, somewhat angular. Calyx-tube campanulate, 25 in. long; lobes 4 to 5, linearsubulate, unequal, 25 to 35 in. long, points hooked. Corolla-tube slender, .75 to 1 in. long, somewhat inflated above; mouth slightly thickened; lobes 4 to 5, spreading, ovate-oblong, apiculate, 5 in. long, ·3 to ·4 in. broad. Stamens in the tube of the corolla; filaments flattened; anthers oblong, mucronate, 25 to 3 in. long. Ovary glabrous, rounded; style slender, clavate, obscurely cleft in 2 short stigmas; cells 2. Fruit didymous; carpels oblong, smooth, white when ripe. Miq. Fl. Ind. Bat. II. 541. J. cauliflorum, Scortechini MS. in Herb. Calcutta.

Perak: at Theripay Taipay, Scortechini; Wray 2840; Cantley 23; King's Collector 2890, 3398, 7059.—Distrib. Sumatra, Forbes 2906.

A very fine species of well-marked characters.

12. Jasminum Scortechinii, King & Gamble, n. sp. A slender climbing shrub, reaching 60 feet in length; branchlets dark-coloured, glabrous. Leaves thin when young, almost coriaceous when old, 3sometimes 1-foliolate, opposite or sub-opposite; terminal leaflet ovate or lanceolate, acuminate at apex, rounded at base; glabrous on both surfaces, upper surface shining, nearly black when dry, lower surface dull, reddish when dry; 2.5 to 4 in. long, 1 to 1.5 in. broad; lateral leaflets similar but slightly smaller and often lanceolate; midrib slender, raised beneath; main-nerves very indistinct, apparently 6 to 8 pairs; petiole .75 in. long, petiolule of end leaflet .5, of side leaflets .3 in. long, all grooved, slender, articulate below the leaflet. Flowers white, in axillary or terminal trichotomous cymes, terminal ones often paniculate; peduncles 5 to 1 in. long; bracts ovate-acute or subulate, 1 in. long; cymes sparsely scaly; bracteoles at the base of the calyx minute; pedicels 1 to 2 in. long, very much enlarged in fruit and then reaching ·5 to ·7 in. in length and ·3 in. in diam. at top. Calyx-tube campanulate, ·125 in. long; teeth 5, very short, triangular. Corolla-tube slender, enlarged above, 4 to 6 in. long; lobes 5, ovate-cordate, obtuse, 3 to 4 in. long, spreading. Stamens included in the corolla-tube; filaments short; anthers oblong, mucronate, 15 in. long, connective broad. Ovary cylindrical, glabrous, 2-celled; style slender, as long as the corolla-tube; stigma clavate. Fruit didymous; carpels ellipsoid, .75 to 1 in. long, ·5 in. broad; pericarp thin, crustaceous, blackish-brown. Seed nearly filling the cavity; testa thin, fragile; cotyledons oblong-obtuse, slightly auricled at base, 5 to 6 in long by 25 in broad, plano-convex.

Penang: Curtis 1227, 2031. Perak: Scortechini 383, 479; Ridley 10679; King's Collector 7006, 7009; Curtis 169.

The description is largely after Scortechini MS. The species comes very near *J. lanceolaria*, Roxb., but differs in its more slender habit, thinner leaves, and large ellipsoid carpels.

Ridley's No. 8325 from Lankawi Island, Kedah, is a twiggy, apparently erect shrub with trifoliolate leaves, the leaflets all obovate-orbicular emarginate, the end one reaching 1·7 in. long and 1·3 in. broad, the side ones only about ·6 in. long and broad. The fruits are of one carpel about the size of a small pea, and the flowers are unknown. It may possibly not be a Jasminum (Herb. Kew).

The following species from Borneo is of interest, and may perhaps be found later on in the Peninsula:—

Jasminum sarawacense, King & Gamble, n. sp. A climbing shrub; branchlets pale brown, terete; internodes rather long. Leaves opposite, chartaceous; elliptic-

oblong, long-acuminate at apex, cuneate at base; both surfaces glabrous; margins recurved; 4 to 7 in. long, 1.75 to 2.75 in. broad; midrib strong, impressed above, raised beneath; main-nerves 4 pairs, the lowest pair near the margin at an angle of about 30° with the midrib, the remaining pairs at about 50°, curving upwards to meet in an intramarginal looped nerve, which is also met by secondary nerves above the fourth pair; reticulations irregular, not prominent; petiole 5 to 75 in. long, twisted in the middle. Inflorescence of axillary, long-peduncled, trichotomous, pubescent, corymbose cymes, about 1 in. broad at top, usually 1 pair from each node; peduncle terete, 2 to 3 in. long, sometimes branched, minutely pubescent; branches very short. ·2 in. long; pedicels clavate, ·1 to ·15 in. long; bracts and bracteoles linear-subulate. ·25 in. long, one pair of bracteoles to each terminal fascicle of 3 flowers; flowers white, buds clavate, 1 in. long. Calyx-tube campanulate, 15 in. long; lobes 6, linear-oblong, applicately infolded at the middle inwards, 15 to 2 in. long, pubescent, Corolla-tube cylindrical, 1 in. long; lobes 6, spreading, oblong, rounded at top, ·4 to ·5 in. long, prominently 3-5-nerved. Stamens 2, inserted at about the middle of the tube within; filaments short, decurrent within the tube; anthers linear-oblong. 2 in. long. Ovary cylindric, truncate and depressed at top, 2-celled; style very slender; stigma clavate. Fruit not known.

Borneo: near Kuching in Sarawak, Haviland & Hose 3489.

2. Osmanthus, Lour.

Trees or shrubs, glabrous. Leaves opposite, evergreen, entire or dentate. Flowers small, axillary or terminal, fascicled or in very short racemes, hermaphrodite or polygamous. Calyx short, 4-toothed or lobed. Corolla-tube short or long; lobes 4, broad, obtuse, imbricate. Stamens 2, more rarely 4, inserted on the corolla-tube; anthers ovate, sub-extrorsely dehiscent. Ovary 2-celled, ovules 2 in each cell, pendulous from its apex; style short or cylindric, 2-lobed or sub-entire. Drupe ovoid or globose; exocarp fleshy, endocarp bony or crustaceous. Seeds usually solitary, pendulous; testa thin; albumen fleshy; cotyledons flat; radicle short, superior.—Distrib. N.W. Himalaya and eastwards to China and Japan, also in Western North America; about 8 to 10 species.

OSMANTHUS SCORTECHINII, King & Gamble, n. sp. A tree, reaching 40 to 50 feet in height, and 10 to 15 in. in diam. of stem; branchlets terete with pale grey, somewhat corky, bark. Leaves coriaceous; lanceolate, shortly acuminate at apex, cuneate at base; both surfaces glabrous; margins entire, recurved; 2 to 4 in. long, 75 to 1.25 in. broad; midrib thick, impressed above, raised beneath; main-nerves very obscure, about 5 to 6 pairs; petiole broad, 3 to 6 in. long, channelled above and bordered by the decurrent margins of the blade. Flowers in very short, close, axillary racemes, reaching 5 in. long in fruit, supported by a pair of ovate, acute, coriaceous bracts; pedicels slender, 05 in. long. Calyx membranous, 06 in. long; lobes 4, slightly serrate. Corolla campanulate, tube 05 in. long; lobes 1 in. long, oblong, obtuse, margins incurved.

Stamens 4, slightly exsert, inserted between the corolla-lobes at the top of the tube; filaments slender; anthers small, ovate, cells dehiscing on the margins or somewhat extrorsely. Ovary conical, glabrous; style slender, subulate, '04 in. long; cells 2, ovules in each cell apparently 2. Drupe globose, '2 to '3 in. in diam.; dark greenish-blue when ripe, exocarp thin, fleshy, endocarp crustaceous. Seed 1, testa membranous; albumen fleshy, ruminate; cotyledons oblong, flat, narrow; radicle superior.

Perak: Scortechini 414—at Thaipeng; Wray 682; King's Collector 5029, 6978.

The structure of the wood, so far as the examination of a very small branch goes, confirms the placing of this plant in the genus Osmanthus.

To this species seems also to belong King's Collector 3663, which has a bright red drupe reaching 5 in. in length, slightly ribbed and with a spathulate embryo having the radicle nearly as long as the cotyledons, each 1 in. It may be called Var. oblonga.

3. LINOCIERA, Swartz.

Shrubs or trees. Leaves opposite, entire. Flowers small, in axillary or extra-axillary, rarely terminal, panicles or cymes; bracts generally small, sometimes rather enlarged and leafy; bracteoles very small. Calyx small, 4-fid or -toothed. Corolla of 4 petals, long or short, nearly free or cohering by pairs or very shortly connate, induplicate-valvate in bud. Stamens 2, rarely 4, inserted at the base of the petals and usually between the two cohering ones; filaments short; anthers elliptic or oblong, dehiscing on the margin or slightly extrorse; connective broad, often apiculate. Ovary 2-celled, ovules 2 in each cell, pendulous from its apex; style short; stigma bifid or entire. Drupe globose or ellipsoid; exocarp fleshy, thin, endocarp bony or crustaceous. Seed usually solitary, pendulous; testa thin; albumen fleshy or 0, if fleshy the cotyledons flattened, radicle superior.—Distrib. Tropics of both hemispheres, species about 40.

Leaves over 4 in. long, main-nerves prominent beneath:

Panicles 4 to 6 in. long, drupe '75 in. long ... 1. L. pauciflora.

Panicles 2 to 4 in. long, drupe 1 or in. long ... 2. L. macrocarpa.

Panicles 1 or 5 to 2 in. long, drupe not known ... 3. L. paludosa.

Leaves under 4 in. long, main-nerves obscure beneath, cymes scarcely 1 in. long ... 4. L. caudata.

1. Linociera pauciflora, Clarke in Hook. f. Fl. Br. Ind. III. 609 (1882). A small tree, reaching 30 to 40 feet in height and 1.5 to 2 feet in diam. of stem; branches moderately stout, pale grey, smooth, swollen at the nodes, internodes slightly angular; branchlets darker coloured,

slender; leaf-buds linear-lanceolate. Leaves coriaceous; elliptic-oblong. rounded or shortly obtusely acuminate at apex, cuneate at base; glabrous on both surfaces, but with prominent raised glandular papillæ; 4 to 9 in. long, 2 to 4 in. broad; midrib stout, slightly impressed above, prominently raised beneath; main-nerves 11 to 13 pairs, fairly prominent and regular, curving upwards to and along the margin near which they anastomose; secondary nerves and reticulations obscure; petiole 7 to 1.3 in. long, thickened at base. Flowers pale yellow or white, in compound axillary panieles, 4 to 6 in. long; main branches 1 to 2 in. long; rachis slender, glabrous, somewhat angular; bracts leafy, ovate or spathulate, 5 to 1 in. or sometimes longer; bracteoles ovate-acute, very small; pedicels slender, 05 to 1.5 in. long, much thickened and pale in fruit even when quite young. Calyx-tube short; teeth 4, ovate-acute. ·05 in. long. Corolla-lobes in two pairs, oblong, ·1 to ·15 in. long. slightly hairy within. Stamens '05 in. long; filaments short, broad. anthers elliptic, emarginate, with a gland on the front of the connective. Drupe ellipsoid, .75 in. long, .3 to .4 in. broad, blueish-black when ripe; exocarp fleshy, endocarp thin, crustaceous. Seed 1, testa pergamaceous; albumen none; cotyledons fleshy, 55 in. long; radicle very small. superior. Olea (?) pauciflora, Wall. Cat. 2812; A.DC. Prod. VIII. 288. Chionanthus palembanica, Mig. Fl. Ind. Bat. Suppl. 558; Kurz For. Fl. II. 159, and Journ. As. Soc. Beng. XLVI. ii. 243.

KEDAH: Curtis. Penang: Wallich 2812A, B; G. King; Curtis 695, 2773; King's Collector 1693; Ridley 10178. Perak: Ridley 7160; Scortechini 952; King's Collector 4172, 4834. Singapore: Ridley 5079.

—Distrib. Tenasserim, Andamans, Borneo (Haviland 1766).

2. LINOCIERA MACROCARPA, King & Gamble. A small tree; branchlets pale grevish-brown, stout, lenticellate; innovations ashypubescent. Leaves coriaceous; obovate-oblong or obovate-lanceolate, obtuse or very shortly and bluntly acuminate at apex, long cuneate at base; glabrous on both surfaces; margins entire or slightly recurved; 6 to 10 in. long, 2 to 3.5 in. broad; midrib very stout, broad and plane above, much raised beneath; main-nerves 14 to 17 pairs, prominent beneath, curved only near the margin to meet in a faint looped intramarginal nerve; secondary nerves and reticulations obscure; petiole 1 to 1.5 in. long, enlarged at base. Flowers in ashy-pubescent panicles, 2 to 4 in. long; bracts leafy, sometimes oblong-lanceolate, more generally spathulate; bracteoles linear-subulate, short; pedicels variable, often 0; rachis and pedicels much enlarged in fruit. Calyx pubescent; tube short; lobes ovate-acute, 05 in. long. Corolla-tube very short; lobes oblong-linear, 1 to 15 in. long, margins much incurved. Stamens .075 in. long; anthers oblong; filaments very short,

connective produced in a conical acumen. Ovary pubescent; style short; stigma 2-lobed. Drupe oblong-ellipsoid, 1·7 in. long, 1 to 1·2 in. broad; exocarp thick, granular; endocarp hard, ·15 in. thick, obscurely ridged outside. Seed 1, testa membranous, albumen fleshy. L. insignis, Clarke in Hook. f. Fl. Br. Ind. III. 610. Chionanthus macrocarpa, Blume Mus. Bot. I. 319 (1849); Koord. & Val. Bijdr. VIII. 239. C. insignis, Miq. Fl. Ind. Bat. Suppl. 559 (1862). C. montanus, Kurz in Journ. As. Soc. Beng. XLVI. ii. 243, and For. Fl. II. 159.

SINGAPORE: at Bukit Mandai, Ridley 4580.—DISTRIB. Tenasserim (Helfer (K.D.) 3688), Martaban (Kurz), Sumatra (Teysmann, Beccari

826), Borneo (Beccari 725).

3. Linociera Paludosa, King & Gamble, n. sp. A small tree (Wray), large tree, 60 to 80 feet high, and 15 to 20 in. in diam. of stem (King's Collector); branchlets thick, pale greyish-brown. Leaves coriaceous; oblong, bluntly acute at apex, also at base; glabrous on both surfaces except on the nerves which are minutely pubescent; margins recurved; 6 to 12 in. long, 2 to 4 in. broad; midrib thick, prominent, slightly raised above, strongly so beneath main-nerves 11 to 15 pairs, impressed above, prominently raised beneath, 75 to 1 in. apart, at first straight then curving upwards to and along the margin to anastomose and form a prominent looped intramarginal nerve; secondary nerves few; reticulations transverse, not prominent; petiole stout, wrinkled, ·5 in. long. Flowers yellow, with a brown centre, in pubescent panicles 1.5 to 2 in, long from the branchlets between the leaf-nodes in the axils of small tubercles; peduncles stout, grey-pubescent, 2 in. long; bracts ovate, grey-pubescent; bracteoles ovate-acute, recurved; pedicels 0.5 in. long. Calyx-tube short, lobes ovate-acute or triangular, ciliate, ·025 in. long, one lobe sometimes enlarged. Corolla-lobes in 2 pairs, linear-oblong, obtuse, 2 in. long, 05 in. broad, glabrous. Stamens ·05 in. long; filaments broad, short; anthers rounded, connective with an obscure gland. Ovary conical, glabrous; style short; stigmas 2. Fruit not known.

PERAK: at Sungie Larút, Wray 2424; on low wet ground, King's Collector 6476.

4. Linociera caudata, King & Gamble, n. sp. A tree, reaching 30 to 40 feet in height and 5 to 7 in. in diam. of stem; branches slender, pale grey, ultimate branchlets darker. Leaves chartaceous; lanceolate, caudate-acuminate at apex, cuneate at base; glabrous on both surfaces; margins entire, recurved; 3 to 4 in. long, 1 to 1.25 in. broad; midrib slender, raised above, scarcely raised beneath; main-nerves very obscure, about 4 to 5 pairs, curving sharply upwards to meet in an intramarginal looped nerve; petiole 1 to 2 in. long, grooved above.

Flowers in axillary or extra-axillary, few-flowered, trichotomous, paniculate cymes about 1 in. long; rachis glabrous, somewhat angular; bracts and bracteoles small, ovate, acute. Calyx ·05 in. long, tube short; lobes 4, ovate, obtuse. Corolla-tube scarcely any; lobes in 2 pairs, oblong, ·1 in. long. Stamens: filaments broad; anthers oblong, cells extrorsely dehiscing; connective apiculate. Ovary glabrous, conical; style very short; stigma bifid. Drupe (immature) obovoid, ·3 to ·4 in. long, seed apparently albuminous.

PERAK: King's Collector 3212, 6857, in dense jungle on high mountains at 3,500 to 4,000 feet.

This species is rather near L. monticola, Bl., but the leaves are narrower and the inflorescence longer.

4. OLEA, Linn.

Trees or shrubs. Leaves opposite, entire or toothed. Flowers small; hermaphrodite, diœcious or polygamous; in axillary, rarely terminal trichotomous panicles; bracts small. Calyx short, 4-toothed or -lobed. Corolla-tube short; lobes 4, induplicate-valvate, sometimes 0. Stamens 2, on the corolla-tube or sub-hypogynous; filaments short; anthers ovate or oblong, cells dehiscing on the margin or slightly extrorse, in 3 flowers sometimes introrse. Ovary 2-celled; ovules 2 in each cell, attached laterally to the septum or sub-pendulous; style short; stigma obtuse, capitate or bifid. Drupe ellipsoid or sub-globose; exocarp fleshy; endocarp bony or crustaceous, usually 1-seeded. Seed pendulous; testa thin; albumen fleshy, sometimes slightly ruminate; cotyledons flat, radicle superior.—Distrib. South Europe and Asia, tropical and South Africa, New Zealand; about 35 species.

SPECIES IMPERFECTLY KNOWN.

1. OLEA DENTATA, Wall. Cat. 2840 (1829). A tree, 40 to 60 feet high; branchlets light brown, smooth, innovations minutely pubescent. Leaves coriaceous; oblong-lanceolate, bluntly acute at apex, cuneate or rounded at base; glabrous on both surfaces, but when young pubescent on the nerves beneath; margins entire or distantly dentate, slightly recurved; 3.5 to 5.5 in. long, 1 to 2 in. broad; midrib slender, im-

pressed above, raised beneath; main-nerves obscure, 8 to 10 pairs, arching upwards to join in a looped nerve near the margin, impressed above; petiole '4 in. long. Flowers in axillary or extra-axillary, leafy, tri-pinnate, minutely pubescent, paniculate cymes, 3 to 6 in. long, branches trichotomous, ultimate cymes umbellate; bracts leafy, oblong or lanceolate, '5 to 1.5 in. long; pedicels slender, '05 to '1 in. long; bracteoles minute, ovate-acute. Calyx minutely pubescent, '05 in. long; lobes 4, ovate, obtuse. Corolla tubular-campanulate, '15 in. long; lobes 4, rounded, '05 in. long. Stamens very small, inserted at the base of the corolla-tube; filaments very short; anthers ovoid, sub-extrorsely dehiscent. Ovary ovoid; style none; stigma capitate; cells 2, ovules 2 in each cell. Drupe not seen. A.DC. Prod. VIII. 286; Kurz in Journ. As. Soc. Beng. XLVI. ii. 245, and For. Fl. II. 157; Clarke in Hook. f. Fl. Br. Ind. III. 613.

Penang: Curtis 222, 950, 2267.—DISTRIB. Burma.

2. OLEA MARITIMA, Wall. Cat. 2813 (1829). A large shrub or small tree; branchlets terete, pale brown; innovations minutely pubescent. Leaves coriaceous; elliptic-lanceolate, acuminate at apex, cuneate or somewhat rounded at base; glabrous on both surfaces; margins entire or distantly serrate on their upper half; 3 to 4 in. long, 1 to 2 in. broad; midrib slender, impressed above, raised beneath; main-nerves obscure, 7 to 10 pairs, meeting near the margin in a looped intramarginal nerve: reticulations scanty: petiole ·2 to ·3 in. long, minutely pubescent when young, finally glabrous. Flowers dull white, polygamous, in slender, minutely pubescent, trichotomous paniculate cymes with few branches; ultimate cymes umbellate, usually .75 to 1 in. long in flower, up to 1.5 in. long in fruit, rarely axillary, usually extra-axillary; each pair of peduncles supported by a pair of ovate lanceolate leafy bracts ·3 to ·5 in. long; common peduncles ·7 in. long; pedicels ·05 to ·1 in. long, bracteoles none. Calyx 05 in. long, minutely rusty-pubescent; tube short; lobes 4, ovate-acute, as long as tube. Corolla campanulate, ·1 to ·15 in. long; lobes 4, obtuse, as long as tube, induplicate-valvate, apparently absent in 2. Stamens 07 in. long, inserted near the base of the corolla-tube; filaments slender; anthers as long as filaments, reniform, cells sub-extrorsely dehiscing. Ovary conical; style none; stigma capitate; cells 2, ovules in each cell pendulous. Drupe globose, 2 in. in diam., black when ripe, wrinkled when dry; exocarp thin, fleshy, endocarp crustaceous. Seed 1, testa very thin, albumen copious; cotyledons elliptic, nearly 1 in. long; radicle somewhat thick. G. Don Gen. Syst. IV. 49; A.DC. Prod. VIII. 288; 288; Clarke in Hook. f. Fl. Br. Ind. III. 612; Mig. Fl. Ind. Bat. II. 547.

Malacca: Griffith (K.D.) 3679; Maingay (K.D.) 1022; Cuming 2318; Ridley 3284, 10731. Pahang: a common bush on the sandy heaths, Ridley in Trans. Linn. Soc. Ser. 2. III. 319. Singapore: Wallich 2813; Walker 183; Ridley 3616A, 8420; King's Collector 1138; Murton 62.—Distrib. Malay Islands.

SPECIES IMPERFECTLY KNOWN.

3. OLEA PLATYCARPA, King & Gamble, n. sp. A small tree with spreading branches, reaching 25 to 30 feet in height; branchlets stout, pale brown, smooth, marked by the prominent horse-shoeshaped scars of fallen leaves. Leaves coriaceous; obovate-oblong or oblong-lanceolate, abruptly acuminate at apex, cuneate at base; glabrous on both surfaces and with scattered glands; margins entire, slightly recurved; 8 to 14 in. long, 3 to 5 in. broad; midrib very stout and prominent; main-nerves 14 to 16 pairs, curving upwards to join in a looped intramarginal nerve close to the margin; secondary nerves few; reticulations irregular, obscure; petiole 1 in. long, base Flowers diccious, in extra-axillary, sessile, enlarged, wrinkled. paniculate, trichotomous cymes, usually on old wood, 1 to 1.5 in. long, supported by a cluster of sheathing scarious bracts; bracts of panicle branches and bracteoles ovate-acute; pedicels very short, stout, somewhat angular. Calyx short, 05 in. long; teeth (in 2 flowers) ovate, obtuse, ciliate. Corolla none in 2, 3 not seen. Ovary conical, rugose; style 0; stigma 2-lobed, mitriform. Drupe ovate-oblong, flattened, '7 in. long, '5 in. broad; exocarp thick, wrinkled when dry; endocarp thick, granular; cells 2. Seed 1, pendulous from the summitof the thin central persistent septum; testa membranous; albumen thick, fleshy; cotyledons ovoid, 15 in. long, radicle rather stout.

Perak: at low levels on the hills, King's Collector 5541, 7649; Hervey.

The absence of male flowers renders the identification of the genus of this plant somewhat uncertain, but we consider it belongs rightly to Olea.

4. OLEA ARDISIOIDES, King & Gamble, n. sp. A small tree; branches slender, terete, with yellowish bark; branchlets minutely pubescent. Leaves coriaceous; lanceolate, long acuminate at apex, cuneate at base; glabrous on both surfaces; margins entire, recurved; 2 to 3 in. long, 6 to 1 in. broad; midrib slender, impressed above, raised beneath; main-nerves 5 pairs, curving upwards to meet in a looped intramarginal nerve, obscure; secondary nerves and reticulations very obscure; petiole slender, 1 to 2 in. long. Flowers in axillary or extra-axillary

slender paniculate cymes, 1 to 2 in. long; rachis somewhat angular, minutely pubescent; bracts leafy, lanceolate, 5 to 1 in. long; bracteoles similar or sometimes subulate-spathulate; pedicels slender, 1 in. long, reflexed. Calyx-tube very short; lobes 4, ovate-acute, 025 in. long, ciliate. Corolla-tube 03 to 05 in. long; lobes 4, induplicate-valvate, linear, 1 in. long. Stamens 2, inserted at the base of the corolla-tube, 05 in. long; filaments slender; anthers elliptic, cells dehiscing laterally, connective mucronate. Ovary conical; style 0; stigma minute, bifid; cells 2. Fruit not seen.

Perak: on Gunong Bubu, 5,000 feet, Wray 3871. Pahang: Barnes 10896.

We have hesitated whether to describe this species as Olea or Linociera, for the corolla-tube is not very long, and the lobes are like those of the latter genus, but the character of the leaves is distinctly that of Olea.

5. MYXOPYRUM, Blume.

Large scandent shrubs with quadrangular branches. Leaves opposite, large, triplinerved, entire or denticulate. Flowers small, yellow, very numerous, in axillary and terminal trichotomous panicles. Calyxtube short, lobes 4. Corolla fleshy; tube urceolate; lobes 4, concave, induplicate-valvate in bud. Stamens 2, inserted on the base of the corolla-tube; filaments very short; anthers rather large, ovate, cells dehiscing laterally. Ovary 2-celled; style very short or 0, stigma 2-lobed; ovules 1 to 2 in each cell, attached near the base at the inner angle. Fruit a 1-2-seeded sub-globose berry; pericarp crustaceous. Seeds 1 to 4, erect, testa membranous, albumen thick; cotyledons flat, ovate, radicle inferior.—Distrib. India and Malaya, 3 species.

Myxopyrum nervosum, Blume Bijdr. 683 (1826). A large climbing shrub; branches with fibrous pale brown bark; branchlets prominently quadrangular. Leaves coriaceous; elliptic or elliptic-oblong or elliptic-lanceolate, acuminate at apex, cuneate or rounded at base; glabrous on both surfaces; margins entire or denticulate in the upper half, prominently recurved; 4 to 7 in. long, 1.5 to 3.5 in. broad; midrib thick, prominent beneath, impressed above; main-nerves 4 to 6 pairs, the lowest pair opposite, very prominent, starting a little above the base and forming an intramarginal nerve looped only after where it meets the rest at about two-thirds of the way up, the next pair not opposite and only starting from about half the length of the leaf; secondary nerves few, reticulations irregular, prominent in dry specimens; petiole 3 to 5 in. long, often twisted, channelled above, articulate at the base. Flowers sessile, in terminal or axillary or extra-axillary, trichotomous, minutely

pubescent panicles, 1.5 to 3 in. long; rachis angular, swollen at the nodes; bracts subulate, recurved, .1 in. long; bracteoles triangular, minute. Calyx-tube very short; lobes 4, triangular, acuminate. Corolla yellowish- or greenish-white, fleshy; tube urceolate, .05 to .1 in. long; lobes oblong, incurved, .05 in. long, induplicate-valvate in bud. Stamens 2, inserted on the tube of the corolla; filaments very short, broad; anthers ovate, rather large. Ovary ovoid; style 0; stigma 2-lobed; cells 2, ovules 2 in each cell, erect from a minute basal central placenta. Berry ovoid or globose, .5 to .7 in. in diam., rough, surmounted by the persistent stigma, blueish-black when ripe; cells 2. Seeds 2 to 4, erect on an enlarged placenta at the base of the central dissepiment; albumen fleshy, testa membranous. Mus. Bot. Lugd. Bat. I. 320, t. 51; A.DC. Prod. VIII. 290; Miq. Fl. Ind. Bat. II. 549; Clarke in Hook. f. Fl. Br. Ind. III. 618.

Penang: Curtis 2849. Perak: Wray 2139, 2834, 4179; Scortechini 532, 598b; King's Collector 3584, 4544, 7392, 8845. Malacca: Maingay (K.D.) 996/3—Distrib. Sumatra (Forbes 1585, in the Lampongs); Java.

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Materials for a Flora of the Malayan Peninsula.—By Sir George King, K.C.I.E., LL.D., F.R.S., late Superintendent of the Royal Botanic Garden, Calcutta, and J. Sykes Gamble, C.I.E., F.R.S., late of the Indian Forest Department.

No. 18.

This part contains nine Natural Orders, viz., Nos. 79 Hydrophyllaceæ to 85 Lentibulariaceæ inclusive, as well as Nos. 87 Bignoniaceæ and 88 Pedalineæ. The whole part is the work of Lieut.-Col. D. Prain, I.M.S., F.R.S., Superintendent of the Royal Botanic Garden, Calcutta, with the exception of Boragineæ, which has been done by Sir George King, and Hydrophyllaceæ and Bignoniaceæ, which have been done by Mr. Gamble.

The nine Orders dealt with contain 53 genera and 150 species: of the species none are here described for the first time.

Natural Order No. 86 Gesneraceæ will follow later on with the three Orders, 75 Apocynaceæ, 76 Asclepiadaceæ, and 77 Loganiaceæ, the preparation of which is not yet quite complete.

Order LXXIX. HYDROPHYLLACEÆ.

Annual or perennial herbaceous plants. Leaves radical or alternate, rarely opposite, entire or dentate, simple or pinnately or palmately lobed. Flowers usually unilaterally sub-sessile on the branches of a bifid or dichotomous scorpioid cyme, or else pedunculate in the axils or on the summits of the branches; regular, hermaphrodite. Calyx

inferior, with 5 or occasionally many equal imbricate lobes. Corolla gamopetalous, funnel-shaped cup-shaped campanulate or rotate; lobes 5, rarely many, imbricate or sometimes twisted. Stamens as many as the corolla-lobes, alternate with them, usually fixed to the base of the tube, exsert or included; filaments filiform, sometimes dilated or appendiculate at base; anthers ovate, oblong or linear, dorsifixed: cells 2, parallel, dehiscing introrsely with longitudinal clefts. Ovary superior, sometimes unilocular, with 2 free or parietal placentas. sometimes more or less completely 2-celled with fleshy placentas adnate to the sentum: styles either 1 filiform bifid or undivided, or 2 distinct from the base; stigmas terminal, small or capitate; ovules 2 to many in each cell. Capsule loculicidally, sometimes septicidally, bi-valved, the placentas if parietal attached to the valves, if central remaining free. Seeds usually oblong, globose or angular, 2 to many on each placenta; testa reticulate or wrinkled, rarely smooth; albumen fleshy, embryo small. erect: cotyledons plano-convex or semi-terete.—Distrib. 150 species, chiefly American, very few in the Old World.

HYDROLEA, Linn.

Herbs or undershrubs. Leaves entire, alternate. Flowers blue, in short terminal cymes or racemes. Calyx divided nearly to the base, segments lanceolate. Corolla widely campanulate, sub-rotate, lobes imbricate. Stamens 5, attached to the corolla-tube; filaments filiform, sometimes dilated at base; anthers sagittate. Ovary completely 2-celled, with fleshy placentas adnate to the dissepiment; styles 2, rarely 3, distinct, filiform; stigmas capitellate; ovules many in each cell, multi-seriate. Capsule globose or ovoid, septicidal, usually 2-, rarely 3- or 4-valved. Seeds minute, irregularly wrinkled.—Distrib. About 14 species, chiefly American, with one Chinese, one of tropical Africa, and one of India and Malaya.

Hydrolea Zeylanica, Vahl Symb. II. 46 (1791). An annual herb; stems nearly glabrous below, glandular pubescent above, soft, somewhat succulent, often rooting, always straggling. Leaves membranous; lanceolate or oblong-lanceolate, attenuate above and below; 5 to 2 in. long, 2 to 5 in. broad; glabrous or slightly pubescent; petiole none or very short and winged by the decurrent blade. Flowers in racemes on short lateral leafy branches. Calyx-lobes acute, glandular-pubescent, 3-nerved, about 3 in. long. Corolla-lobes ovate, 2 in. long, many-nerved, blue. Stamens with sagittate, often twisted anthers, and filaments dilated at base. Capsule shorter than the calyx-lobes, ovoid, 2-lobed; placentas central, adherent at their backs to the dissepiment. Seeds very many,

oblong, obtuse, testa very faintly wrinkled. Lamk Ill. t. 184; Wall. Cat. 4398; W. & A. in Hook. Comp. Bot. Mag. II. 193, t. 26; Wight Ill. t. 167, and Ic. t. 601; Choisy in DC. Prod. X. 180; Dalz. & Gibs. Bomb. Fl. 170; Miq. Fl. Ind. Bat. II. 633; Clarke in Hook. f. Fl. Br. Ind. IV. 133; Trimen Fl. Ceyl. III. 191. Cooke Bomb. Fl. II. 197; Prain Beng. Plants 711. H. javanica, Blume Bijdr. 725. Nama zeylanica, Linn. Sp. Pl. 226; Roxb. Fl. Ind. II. 73. "Tsjeru Vallel," Rheede Hort. Mal. X. t. 28.

Perak: Wray 2571, 3336; Scortechini; Ridley 2906; King's Collector 391, 2577.—Distrib. Throughout India, Ceylon, Burma, Siam, Java, Malaya, China, the Philippines; also in Australia, tropical Africa and America, in wet places and rice-fields.

Order LXXX. BORAGINEÆ.

Herbs, shrubs, or trees, often conspicuously hispid or scabrous. Leaves alternate, very rarely opposite, ex-stipulate, usually entire, rarely in verticils. Flowers usually in scorpioid dichotomous cymes, sometimes trichotomously paniculate, rarely solitary and axillary, bracteate or not, hermaphrodite. Calyx inferior, 5-lobed (rarely 6- to 8-lobed), the lobes imbricate, rarely valvate, usually persistent in fruit. Corolla gamopetalous, of various forms, often with scales in the throat; the limb 5-lobed (rarely 4- to 6-lobed), the lobes imbricate, rarely twisted. Stamens as many as the lobes and alternate with them, inserted on the tube; anthers ovate to linear, introrse; filaments slender, often dilated at the base. Disk under the ovary or obsolete. Ovary superior, sessile, cells 2 with 2 ovules in each, or 4 with 1 ovule in each; style terminal or from the depression between the lobes of the ovary, long or short; stigma entire and capitate or 2-lobed, the style rarely twice bifid; ovules sub-erect from the basal angle of the cell. Fruit drupaceous with a hard 2- to 4-celled endocarp or dividing into 2 or 4 nutlets with thin or fleshy walls. Seeds erect or oblique, with membranous testa and fleshy albumen or ex-albuminous; embryo curved or straight, radicle superior.—DISTRIB. Universal. about 1,500.

below or at the stigmas:-

Styles short, shortly 2-lobed; pyrenes two 2-seeded; herbs		
or shrubs	2.	Tournefortia.
Styles elongated, dilated at the apex; pyrenes four 1-seeded,		
much resembling nutlets; herbs	3.	HELIOTROPIUM.
Styles elongated, not dilated or annular at the apex, more or		
less bi-partite:—		
Styles 2-fid at the apex; pyrenes two 2-seeded, or four		
1-seeded; trees or shrubs	4.	EHRETIA.
Styles more or less separate, distinct at base and apex,		
united but easily separable in the middle; pyrenes four		
1-seeded, much resembling nutlets; prostrate herbs	5.	COLDENIA.

1. CORDIA, Linn.

Trees or shrubs. Leaves alternate, rarely sub-opposite, petiolate. Flowers in dichotomous cymes with scorpioid branches, or corymbose or in clusters, ebracteate, polygamous, the & fewer than the &. Calyx tubular or campanulate, usually with short and often irregular teeth, accrescent in fruit. Corolla funnel- or salver-shaped or campanulate; the lobes of the limb 4 to 8, spreading or recurved, white or orange. Stamens as many as the lobes; anthers sagittate or hastate, shortly exserted; filaments often hairy near the base. Ovary 4-celled, glabrous; style terminal, long, bi-partite, the branches again bifid, linear or sub-spathulate, cells of ovary 1-ovuled. Fruit ovoid or ellipsoid, surrounded by the enlarged calyx; the putamen bony, with 1 to 4 cells, but one only with a fertile seed. Seed exalbuminous, the cotyledons large and fleshy or thin but always plicate.—Distrib. About 280 species, all tropical.

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Flowers about 1.5 in. long . . . . . . . . . . . . 1. C. subcordata. Flowers less than 5 in. long:—

Leaves broadly ovate, sub-acute or obtuse, the base often cordate 2. C. Myxa.

Leaves ovate-lanceolate, acuminate, the base cuneate . . 3. C. Griffithii.
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1. Cordia subcordata, Lamk Ill. 1899 (1792). A small tree; young branches as thick as a goose-quill, glabrous, pale brown when dry. Leaves membranous; broadly ovate or ovate-rotund, the apex acute, the base broadly rounded or sub-cordate; both surfaces brown when dry, the lower paler, harshly and minutely reticulate; main-nerves 4 or 5 pairs, faint on both surfaces when dry; length 3.5 to 6.5 in., breadth 2.5 to 4 in.; petiole 1.25 to 2 in. Corymbs lateral, few-flowered, shorter than the leaves, glaberulous; pedicels .25 in. long. Calyx cylindric, slightly widening towards the mouth, 4 in. long and nearly .2 in. wide at the middle, glabrous; the limb with 3 broad triangular teeth. Corolla about 1.3 in. long, orange or reddish, funnel-shaped; lobes about 6, broad, spreading, as long as the tube. Stamens 6.

Stigma with linear-spathulate branches. Fruit very bony, pyramidal, its apex acute, with 4 bold angles, the spaces between the angles often with large tubercles, 1 in. long and as much in breadth from angle to angle, usually with 1 or more seeds; entirely enveloped in the muchinflated glabrous accrescent apiculate calyx. Wall. Cat. 9063; DC. Prod. IX. 477; Seem. Fl. Viti, t. 34; Benth. Fl. Austral. IV. 385; Kurz For. Fl. Burm. II. 209; Clarke in Hook. fil. Fl. Br. Ind. IV. 140; Miq. Fl. Ind. Bat. II. 914. C. orientalis, R. Br. Prod. 498. C. campanulata, Roxb. Fl. Ind., ed. Carey & Wall. II. 336. C. Rumphii, Blume Bijdr. 843. C. hexandra, Roem. & Schult. Syst. IV. 799. Rumph. Herb. Amb. II. t. 75.

Perak: Scortechini 1084. DINDINGS: Curtis 3447. Kedah: Ridley 5526. Pahang: Ridley 2158.—Distrib. British India, Malay Archipelago, Australia, Sandwich Islands. Widely cultivated in other places.

2. CORDIA MYXA, Linn. Sp. Pl. 190 (1753). A tree, 40 to 50 feet high; young branches thinner than a goose-quill, glabrous. Leaves thinly coriaceous; broadly ovate, apex sub-acute or obtuse, the base slightly cordate; upper surface when dry dark brown, glabrous, faintly reticulate; the lower paler brown, distinctly and minutely reticulate, the transverse veins very prominent, glabrous except for some pubescence on the midrib and 5 or 6 pairs of curved ascending main-nerves; length 3 to 3.75 in., breadth 2 to 2.75 in.; petioles .75 to 1.25 in. Cymes trichotomous, shorter than the leaves, terminal. Male and female flowers often in the same tree, mostly 5-merous. Calyx campanulate, more than 25 in. long, glabrous, smooth outside, silky inside. Corolla with its tube included in the calyx, the lobes projecting and 15 in. long, reflexed; style in the 2 flowers short, 4-cleft, absent in the 3. Fruit ellipsoid, with acute apex and rounded base, compressed, with 3 or 4 angles (one or more of them indistinct), .75 in. long and ·4 in. broad, 2- or more-seeded; the persistent accrescent calyx leathery with strong vertical reticulations, widely campanulate, its mouth with shallow irregular crenations, length ·25 in., width ·4 to 5 in. DC. Prod. IX. 479; Delile Fl. Ægypt. t. 19, fig. 1; Roxb. Fl. Ind., ed. Carey & Wall., II. 232; Wall. Cat. 889; Wight Ill. t. 169; Benth. Fl. Austral. IV. 386; Bedd. Fl. Sylv. t. 245, fig. A; Brandis For. Fl. 336 (in part); Kurz For. Fl. Burm. II. 208; Boiss. Fl. Or. IV. 124; Miq. Fl. Ind. Bat. II. 915; Clarke in Hook. fil. Fl. Br. Ind. IV. 136; Trimen Fl. Ceyl. III. 193; Cooke Fl. Bomb. II. 199; Prain Beng. Plants 714. C. Myxa, var. b. minor only, Thw. Enum. Pl. Zeyl. 214. C. indica, Lamk Diet. VII. 49; DC. Prod. IX. 500. C. officinalis and C. africana, Lamk Ill. II. 420, and t. 96, fig. 3. C. Sesbestena, Forsk. Fl. Aeg.-Arab. LXIII. C. paniculata, Roth Nov. Spec. 124; DC. Prod.

IX. 482. Sebestena officinalis, Gaertn. Fruct. I. 364, t. 76. Ehretia glabra, Roth Nov. Spec. 127; DC. Prod. IX. 510. Beurreria glabra, G. Don Gen. Syst. 390.

MALACCA and SINGAPORE: probably introduced.—DISTRIB. Tropics of the Old World.

3. Cordia Griffithii, Clarke in Hook. fil. Fl. Br. Ind. IV. 139 (1883). A small tree; young branches about as thick as a crow-quill, puberulous, pale and angled when dry. Leaves thinly coriaceous; ovate-lanceolate, acute or acuminate, the base slightly cuneate; both surfaces brown when dry (the lower the paler), minutely reticulate, glabrous; mainnerves 3 or 4 pairs, curved, ascending; length 1.5 to 3.5 in., breadth 1 to 1.75 in.; petioles .65 to 1.25 in. Cymes slender, 2.5 to 4 in. long (including their peduncles), dichotomous, lax, few-flowered, puberulous. Flowers 4 in. long, almost sessile. Calyx 25 in. long, funnelshaped; the mouth wide, oblique, and with 5 irregular short teeth. Corolla funnel-shaped, much longer than the calyx; the limb longer than the tube, deeply divided into 5 narrowly elliptic reflexed lobes. Stamens 5, attached to the throat of the tube; anthers oblong, exserted; filaments unequal in length, flattened below. Ovary obovoid, smooth, 4-celled, ovules solitary in each cell; style thin and cylindric above, swollen in its lower half, exserted.

MALACCA: Griffith (K.D.) 5997; Maingay (K.D.) 1162; Ridley 4561. Selangor: Ridley 7373. Kedah: King's Collector 1742.

2. Tournefortia, Linn.

Trees or shrubs, sometimes almost herbs, and often sub-scandent. Leaves alternate, entire. Cymes scorpioid, dichotomous, usually terminal, rarely lateral or extra-axillary. Flowers small, numerous, crowded, sessile or on short pedicels, ebracteate. Calyx deeply 4- or 5-partite, the segments ovate or lanceolate. Corolla white or greenish; the tube cylindric, naked in the throat; the lobes of the limb 5 or 4, small, spreading. Stamens 5 or 4, included in the tube; anthers oblong-ovate or lanceolate, apiculate or not; filaments short. Ovary 4-celled; style terminal, short, 2-lobed (in the Indo-Malayan species); ovules 1 in each cell, pendulous from the upper inner part of the cell. Drupe small, ovoid, slightly fleshy or leathery, indistinctly separating into two 2-seeded or into four 1-seeded pyrenes. Seeds straight or curved, pendulous, albuminous; embryo straight or curved.—Distrib. About 130 species, in the tropics of both hemispheres.

Tournefortia Wallichii, DC. Prod. IX. 527 (1845). A climber, 10 to 30 feet long; young branches terete, twice as thick as a crow's-quill, minutely rusty-puberulous, becoming glabrous. Leaves thickly mem-

branous; ovate, the apex acute or shortly acuminate, the base rounded, slightly oblique; both surfaces when dry brown, the upper quite glabrous, the lower paler, reticulate, sometimes with a few small hairs on the nerves; main-nerves 4 or 5 pairs, curved, ascending, depressed like the midrib on the upper surface, prominent on the lower; length 2 to 3.5 in., breadth .75 to 1.75 in.; petioles .3 to .4 in. Cymes terminal and lateral (extra-axillary), on long peduncles, dichotomously branched, sub-glabrous. Flowers 3 to 4 in. long, sessile, forming crowded one-sided pseudo-spikes (scorpioid cymes) on the terminal inch or two of the branches of the cymes. Calyx about 05 in. long, only about a sixth or a seventh as long as the corolla, cleft nearly to the base into 4 broadly triangular acute spreading segments. Corolla-tube 4-angled; the limb short, with 4 ovate teeth, glabrous. Anthers 4, oblong, sessile or nearly so, near the throat. Fruit broadly ovoid, ·15 to ·2 in. long, with 4 vertical grooves (2 of them deep) on the sides, and a depression on the apex. Clarke in Hook. fil. Fl. Br. Ind. IV. 147. T. tetrandra, Wall. Cat. 911 (not of Blume). Tetrandra Wallichii, Miq. Fl. Ind. Bat. II. 928.

SINGAPORE: Maingay (K.D.) 1165, 8041; King's Collector 302. PERAK: Wray 3536; Ridley 2431; King's Collector 3335, 5158 Scortechini 1494.—DISTRIB. Java, Sumatra.

3. HELIOTROPIUM, Linn.

Annual or perennial herbs, very hairy or scabrous. Leaves alternate. Flowers small, white, or pale purple, sometimes in terminal dichotomous cymes with scorpioid branches and small or no bracts, sometimes axillary in the axils of large bracts. Calyx divided into 5 linear or lanceolate segments. Corolla with a cylindric tube and limb of various shapes, the lobes of the latter always imbricate or induplicate in bud, spreading in flower. Stamens 5, included, inserted on the tube by short filaments; anthers ovate-oblong or lanceolate. Ovary completely or imperfectly 4-celled, 4-ovulate; style short or long, terminal, with a depressed conical or flat disk on its apex; stigma above the disk, none or short or elongate, entire or rarely bifid. Fruit dry, 2- to 4-grooved or -lobed, and consisting of 4 nutlets free from the beginning or finally becoming so. Seeds straight or curved; albumen none, small or large; cotyledons plano-convex.—Distrib. Species about 225, widely distributed in both hemispheres.

Leaves ovate-lanceolate, 1.5 to 2.5 in. long 1. H. indicum.

Leaves linear, .5 to 1 in. long 2. H. strigosum.

1. Heliotropium indicum, Linn. Sp. Pl. 130 (1753). Herbaceous,

but woody at the base, a foot or two in height, with few branches; the branches, lower parts of the inflorescence, and the petioles with white stiff hairs. Leaves membranous, greenish-brown when dry; ovate or ovate-lanceolate, slightly inequilateral, the apex usually acute, the base rounded, irregularly cordate, often unequally so; both surfaces with some scattered long white hairs: the lower surface pale and faintly reticulate when dry: main-nerves 6 to 8 pairs, rather straight, ascending, slightly prominent on the lower surface; length 1.5 to 2.5 in., breadth .75 to 2 in.; petioles .4 to 1.5 in. Cymes scorpioid. terminal and lateral (extra-axillary), about 2 in. long (lengthening with age to 5 or 6 in.), on peduncles about 1 in. long; the rachises hispid, compressed when dry. Flowers about 15 in. long, sessile, numerous. Calyx about 05 in. long, deeply divided into 5 narrowly lanceolate sub-erect hispid segments. Corolla tubular, slightly dilated at the base: the limb with 5 broad blunt reflexed lobes; anthers 5, included, inserted about the middle of the tube. Fruit 1 in. long, conical, with an apical beak and with 4 bold vertical ridges and 4 faint ones, glabrous naturally separating into 2 halves, each half consisting of 2 cohering pyriform pyrenes with long beaks and a single large sub-quadrate white seed. Roxb. Fl. Ind. I. 454; Bot. Mag. t. 1837; Clarke in Hook. fil. Fl. Br. Ind. IV. 152; Trimen Fl. Ceyl. III. 200; Cooke Fl. Bomb. II. 207; Prain Beng. Plants 716. H. anisophyllum, Beauv. Fl. Ow. et Ben. II. 62, t. 96. Tiaridium indicum, Lehm. Asperifol. 14; Wall. Cat. 913; Wight Ill. t. 171. T. anisophyllum, G. Don Gen. Syst. IV. 364. Heliophyllum indicum, DC. Prod. IX. 556; Fresen, in Mart. Fl. Brasil, fasc. 22, 48, t. 10, fig. 4; Miq. Fl. Ind. Bat. II. 925. H. velutinum, DC. l.c. 557.

SINGAPORE: King's Collector 318; Hullett 21. Pahang: Ridley 1547. Penang: Deschamps. Perak: Scortechini 163.—Distrib. India, Malaya, E. Asia, tropical Africa and America.

2. Heliotropium strigosum, Willd. Sp. Pl. I. 743 (1797). Herbaceous, woody at the base, erect, a foot high, the branches few, slender, long, not spreading, very strigose, like all the rest of the plant. Leaves linear, ·5 to 1 in. long, very narrow, becoming smaller upwards. Flowers under ·1 in. long; their pedicels longer, sub-opposite to a linear bract or often extra-axillary. Sepals ovate-acute, enlarging in fruit. Corolla salver-shaped; stigma narrowly conical. Fruit depressed, 4-lobed, under ·1 in. broad, glabrous and shining, sometimes with a few small hairs. DC. Prod. IX. 546; Clarke in Hook. fil. Fl. Br. Ind. IV. 151; Boiss. Fl. Orient. IV. 143; Prain Beng. Plants 716. H. brevifolium, Wall. Cat. 914; Wall. in Roxb. Fl. Ind., ed. Carey & Wall. II. 2; DC. l.e. 546. H compactum, Don Prod. 101.

In all the provinces, by waysides, not common.—DISTRIB. From W. Asia through India to Australia.

4. EHRETIA, Linn.

Glabrous or scabrous shrubs or trees. Leaves alternate, entire or dentate. Flowers small, usually white, in axillary or terminal corymbs or panicles, rarely on 1-flowered axillary peduncles. Calyx small, 5-partite. Corolla with short cylindric tube; the limb with 5 obtuse imbricate spreading lobes. Stamens 5, inserted on the tube, exserted, rarely included, ovate or oblong. Ovary 2-celled, the cells bi-ovulate; sometimes imperfectly 4-celled and the cells with solitary ovules; style terminal, cylindric, bifid or bi-partite; stigmas small, capitate or clavate. Drupe small, usually globose, 4-seeded or (by suppression) 1-3-seeded; usually dividing into 2 bilocular or into 4 unilocular, often compressed pyrenes. Seeds straight, with little albumen and thin testa.—Distrib. About 55 species, all tropical, chiefly in the Old World.

1. EHRETIA LEVIS, Roxb. Cor. Pl. I. 42, t. 55; var. timorensis, Clarke in Hook, fil. Fl. Br. Ind. IV. 142 (1883). A small tree; young branches rusty-puberulous, becoming ultimately glabrous, dark coloured when dry. Leaves thinly coriaceous; ovate to elliptic-oblong, shortly acuminate, the base slightly cuneate or sometimes rounded; both surfaces glabrous, brown when dry, the lower paler and reticulate; mainnerves about 5 pairs, rather straight, ascending slightly, thin but prominent on the lower surface like the midrib; length 2.5 to 5 in., breadth 1.25 to 2.25 in.; petioles about 4 in. Cymes axillary and terminal, shorter than the leaves, corymbose, puberulous; the ultimate branches scorpioid. Flowers small, numerous, sessile. Calyx less than 1 in. long, its mouth with 5 oblong lobes. Corolla-tube 1 in. long; the lobes 5, shorter and spreading. Anthers exserted. Fruit when 4-seeded about 2 in. in diam., smaller when 2-seeded, depressedglobose, ribbed; pyrenes 4 or 2, sometimes only 1, each with a single seed; the persistent calvx much shorter than the fruit, its lobes acuminate. E. timorensis, Done. in Nouv. Ann. Mus. d'Hist. Nat. III. 395; DC. Prod. IX. 505. E. philippinensis, DC. l.c. 504. E. lævis, Benth. Fl. Austral. IV. 389.

Malacca: Maingay (K.D.) 1164; Ridley 3302. Perak: Scortechini

167, 898; King's Collector 7436, 8344.—Distrib. Burma, Griffith (K.D.) 6002, Malay Archipelago, Australia.

2. EHRETIA PARALLELA, Clarke in Hook. fil. Fl. Br. Ind. IV. 143 (1883). A shrub, all parts except the inflorescence glabrous; young branches thinner than a goose-quill, pale when dry. Leaves membranous; obovate or obovate-elliptic, obtuse, from retuse to sub-acute, cuneate at the base; both surfaces dark brown when dry; main-nerves 7 or 8 pairs, scarcely curved, ascending, parallel, very bold and distinct on the lower surface like the midrib (when dry), faint on the upper; length 1.5 to 1.75 in., breadth .75 to 1 in.; petiole .25 in. Inflorescence, flowers, and fruit as in E. lævis, Roxb., var. timorensis, but smaller.

Penang: Curtis 1572.—Distrib. Burma, Griffith (K.D.) 6004.

5. COLDENIA, Linn.

Much-branched, diffuse or prostrate scabrous herbs. Leaves alternate, crisped. Flowers small, axillary, sessile or sub-sessile; the upper sometimes in a short one-sided bracteate cyme. Calyx 4-5-partite. Corolla with short funnel-shaped tube and 4 or 5 spreading segments imbricate in bud. Stamens 4 or 5, inserted on the tube; anthers ovate. Ovary broadly ovoid, 2-celled, with 2 ovules in each cell, or imperfectly 4-celled with 1 in each; styles 2, distinct at the base but united upwards (although easily separable); stigmas 2, capitate. Fruit almost dry, composed of 4 sub-connate 1-seeded pyrenes; seeds with thin testa and little if any albumen; the cotyledons plane.—Distrib. Species 12, 10 of which are American, 1 African, and the undernoted which is cosmopolitan.

Coldenia procumbens, Linn. Sp. Pl. 125 (1753). A scabrous-hairy prostrate herb. Leaves elliptic-obovate, coarsely and deeply serrate, almost pinnatifid. Fruit, prior to disintegration into its component pyrenes, pyramidal. Gaertn. Fruct. I. 329, t. 68; Lamk Ill. t. 69; Roxb. Fl. Ind. I. 448; Wall. Cat. 942; DC. Prod. IX. 558; Miq. Fl. Ind. Bat. II. 933; Clarke in Hook. fil. Fl. Br. Ind. IV. 144; Trimen Fl. Ceyl. III. 197; Cooke Bomb. Fl. II. 205; Prain Beng. Plants 718. Lobophyllum tetrandrum, F. Muell. in Hook. Kew Journ. Bot. IX. 21. Waltheria microphylla, Miq. in Pl. Hohenack. n. 878 (not of Cav.).

By waysides, not common.—DISTRIB. Everywhere in the tropics.

Order LXXXI. CONVOLVULACEÆ.

[By D. Prain.]

Herbs or shrubs, usually twining, occasionally erect; very rarely trees; sometimes parasitic. Leaves alternate or in parasitic species

obsolete; stipules 0. Flowers in cymes, rarely solitary, regular, hermaphrodite; bracts at cyme-bases or under solitary flowers opposite; bracteoles at base of pedicels small, scale-like. Sepals 5, imbricate, occasionally slightly connate below, often persistent, sometimes accrescent. Corolla campanulate or infundibuliform, rarely sub-rotate; limb with 5 short or long lobes often plicate in bud, after flowering either involute or reverting to the original æstivation. Stamens 5, adnate to corolla-tube; anthers oblong, opening by longitudinal introrse or lateral slits. Carpels usually 2, very rarely 3 or more; connate throughout in a superior ovary with its base often encircled by an annular or lobed disk, and its cells as many or, by development of accessory partitions, twice as many as the component carpels, rarely, from absorption of dissepiments, fewer than carpels; ovules 2 in each carpel, sessile erect anatropous; style solitary or rarely styles 2; stigma capitate or 2-lobed or 2-fid. Fruit an indehiscent often dry berry, or a 2-4-valved or circumscissile or irregularly opening capsule. Seeds 4 to 2, rarely solitary, erect; albumen scanty or 0; cotyledons generally plicate, rarely flat.—DISTRIB. Species about 1,000, in all regions, but more abundant in sub-tropical and tropical countries.

Corolla-tube usually uniformly enlarged from base to apex, the 5 bands or lobes rarely, except in Erycibe, clearly defined from the intervening spaces; pollen not spinulose:-1. Cuscuta. Yellow parasitic twining leafless herbs ... Green non-parasitic leafy herbs, shrubs or trees :-Fruit indehiscent, woody or fleshy, rather large; style short or 0; stigma 5-10-rayed; corolla-lobes 2-fid, the lobules induplicate, contorted; woody, climbing shrubs or erect trees 2. ERYCIBE. Fruit dehiscent, or if indehiscent small, with thin fragile walls :-Flowers in racemes or panicles -Bracts not enlarged in fruit; outer 3 or all of the sepals enlarged in fruit; style entire or shortly 2-lobed; capsule 3. PORANA. indehicent or rarely 2-valved Bracts in fruit much enlarged, scarious, adnate to calyx; 4. NEUROPELTIS. sepals not enlarged; capsule 4-valved, 1-seeded ... Flowers in cymes or solitary; capsule valvate or opercular, rarely dehiscing irregularly :-Styles 2, free or partially united below; sepals not or slightly enlarging in fruit:-Capsule 4-valved, 2-1-locular, 4-2-seeded; styles quite .. 5. Evolvulus. free, each 2-branched; cymes few-flowered Capsule irregularly dehiscent, splitting into numerous vertical segments; styles usually partially united below, 6. Bonamia. stigmas capitate; cymes sub-capitate Style entire, stigmas usually 2:-Ovary 1-locular; capsule 4-valved, 4-seeded; stigmas

shortly oblong; calyx-lobes not enlarged in fruit:-

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Bract enveloping the calyx; pollen spherical
                                                           .. 7. CALYSTEGIA.
           Bract not enveloping the calyx; pollen polyhedral .. 8. Hewittia.
          Ovary 2-locular, sometimes 4-locular:-
            Outer 3 sepals much larger than the 2 inner, and
            decurrent on the peduncle; stigmas capitate
                                                           .. 9. Aniseia.
            Outer 3 sepals not larger than the 2 inner, and not
            decurrent on the peduncle :-
              Stigmas elliptic; capsule 8-valved, rarely 4-valved 10. JACQUEMONTIA.
              Stigmas globose:-
                Capsule 4-valved; fruiting sepals not enlarged;
                bands of corolla usually with 5 purple lines;
                                                          .. 11. MERREMIA.
                stems not winged
                                     . .
                                                ...
                Capsule with circumscissile dehiscence; fruiting
                sepals considerably enlarged; bands of corolla
                without lines; stems winged
                                               . .
                                                           .. 12. OPERCULINA.
Corolla-tube not uniformly enlarged from base to apex, the
5 bands on the lobes clearly defined by 2 prominent lines; pollen
spinulose :---
  Fruit dehiscent, or if indehiscent then with thin fragile walls:-
    Stamens arising from the backs of 5 scales attached to
    the corolla-tube; flowers small urceolate, fasciculate; fruit
                                                            .. 13. LEPISTEMON.
    4-valved
    Stamens arising directly from the corolla-tube :-
      Corolla more or less campanulate; calyx-lobes never
      aristate, inflorescence never scorpioid; stamens not ex-
                                                            .. 14. Іромова.
               .
      Corolla more or less hypocrateriform; calyx-lobes aristate,
      or if obtuse the inflorescence scorpioid; stamens exserted:-
        Flowers rather small, pink or red, slightly irregular
                                                          .. 15. QUAMOCLIT.
        Flowers large white, regular
                                                            .. 16. CALONYCTION.
  Fruit indehiscent, coriaceous or fleshy:-
                                                           .. 17. ARGYREIA.
    Ovary 4-celled ...
    Ovary 2-celled ...
                                                           .. 18. LETTSOMIA.
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1. Cuscuta, Linn.

Leafless twining yellow-reddish parasitic herbs. Flowers small, white or rose-coloured, fascicled, sessile or shortly pedicelled; bracts small or 0. Sepals 5 or 4, sub-equal; free or shortly connate at the base. Corolla ovoid or campanulate, usually with a ring of fimbriate or lobed scales near the base or below the stamens; lobes short, imbricate. Stamens 5 or 4, adnate near throat of corolla; filaments short, linear; anthers oblong, partially exserted. Ovary more or less completely 2-celled; ovules 4; styles 2 or 1; stigmas 2. Fruit a globose or ovoid, dry or succulent, circumseissile or irregularly bursting 4-2-seeded capsule. Seeds glabrous; albumen fleshy; embryo slender, spiral; cotyledons minute or obsolete.—Distrib. Species about 80, in temperate and tropical regions.

Cuscuta Hygrophilæ, H. H. W. Pears. in Hook. Ic. Plant. t. 2704.

A small slender parasitic twiner. Flowers in dense umbellate cymes, ·25 in. wide. Sepals ovate obtuse, connate below, ·1 in. long. Corolla ·15 in. wide, campanulate; lobes ovate obtuse. Stamens 5, shortly exserted. Scales near base of corolla-tube shortly fimbriate. Ovary obtuse, more or less perfectly 2-celled; ovules 4; styles 2; stigmas capitate. Fruit an oblate capsule, 15 in. wide.

JOHORE: near the town, parasitic on Hygrophila quadrivalvis, Ridley 9161!

Closely related to C. chinensis, from which it differs in having the sepals without keels, and of which the writer believes it to be a form.

2. ERYCIBE, Roxb.

Shrubs, scandent or diffuse, less often erect; rarely trees. Leaves alternate, elliptic, entire, coriaceous. Flowers rather small; cymes in axillary or terminal panicles or racemes; bracts lanceolate, small. Sepals 5, small, sub-equal, orbicular, coriaceous, adpressed to base of fruit. Corolla rather small, white or yellowish, sub-rotate; tube hirsute externally; limb 5-lobed, the lobes obcordate, induplicate-contorted in bud, with a thicker triangular centre externally hirsute, and submembranous semicordate margins glabrous on both sides. Stamens 5, sub-included, adnate to throat of corolla; filaments short; anthers ovate-lanceolate. Ovary globose, 1-celled; ovules 4; stigma large, sessile, sub-globose or conic, 5- or 10-ridged. Fruit a fleshy, leathery or woody berry, ovoid or ellipsoid. Seed solitary, glabrous; albumen scanty, intruded between folds of fleshy cotyledons.—DISTRIB. Species about 30; throughout S.E. Asia.

Leaves more or less pubescent beneath:-

Pubescence on under surfaces of leaves persistent:-

Branches angular; bark fissured; pubescence on under side of leaves black, closely adpressed; leaves with acuminate tips, the lateral nerves in 5 pairs, obliquely ascending, hardly visible above Branches cylindric; bark not fissured: pubescence on under

surface of leaves not adpressed, brown or tawny; leaves obtuse, the lateral nerves in 12 to 15 pairs, spreading not very oblique; fruit velvety ...

Pubescence on under surface of leaves usually disappearing, except from the midrib, as the leaves become old; branches with fissured bark :-

Flowers in pyramidal terminal panicles, the panicle branches subtended by foliaceous bracts 3. E. expansa. Flowers in axillary cymes, or if passing into a terminal

panicle the panicle branches not subtended by foliaceous bracts :--

.. 1. E. strigosa.

.. 2. E. magnifica.

Flowers often passing into a terminal panicle; corolla		
greenish; fruit ellipsoid, black, '6 in. long, '35 in. wide	4.	E. Princei.
Flowers all axillary; corolla white; fruit ellipsoid, purple,		
with a faint apical areola, .75 in. long, .5 in. wide	5.	E. malaccensis.
Leaves quite glabrous on both surfaces:—		
Flowers in both terminal and axillary panicles; leaves with		
lateral nerves distinct, but secondary venation indistinct	6.	E. angulata.
Flowers always axillary:—		
Leaves small, never exceeding 1.75 in. long, sub-bifarious;		
flowers solitary, axillary	7.	E. leucoxyloides.
Leaves medium to large, very rarely, and never all, less		
than 2 in. long, arranged spirally; flowers never solitary:-		
Lateral nerves of leaves distinct and secondary reticulate		
venation distinct on both surfaces, or at least beneath:-		
Lateral nerves of leaves 7 to 9 pairs	8.	E. festiva.
Lateral nerves of leaves 6 or fewer pairs:—		
Fruit quite glabrous	9.	E. sapotacea.
Fruit finely velvety	10.	E Stapfiana.
Lateral nerves of leaves indistinct, secondary venation not		
visible:—		
Corolla rufous-pubescent internally as well as ex-		
가게 하는 사람들은 사람들이 가득하면 보다 가는 사람들이 되었다. 그 사람들은 사람들이 가득하는 것이 되었다.	11.	E. præcipua.
Corolla glabrous internally :—		
Flowers densely glomerate in leaf axils; leaves pale	12	
유료를 하는 것 같아 있는 것이 하면 없는 밖에 하면 하면 하는 것 같아. 이 그는 그 것 같아. 그는 그 가는 그를 하는 것 같아.	12.	E. glomerata.
Flowers in short but open axillary cymes :—		
Leaves thickly coriaceous; fruit verrucose but not		
그림이 그렇게 선생님이 있는 그 바람이 그림에 살아 집중하는 아이를 하면 하는데 하는데 되었다. 그는데 하는데 그는데 하는데 그를 하는데 하는데 되었다.	13.	E. aenea.
Leaves sub-coriaceous; fruit scurfy but not verru-	. ,	TI 0 100 11
cose externally	14.	E. Griffithii.

1. ERYCIBE STRIGOSA, Prain Journ. As. Soc. Beng. LXV. 2. 536. A climber 40 to 60 feet long, with stems 1 to 2 in. in diam.; branches slightly angled with fissured bark, and except along the fissures densely clothed with black adpressed tomentum; branchlets angular with black adpressed tomentum. Leaves elliptic or ovate-lanceolate, base cuneate, apex rather long acuminate, with tip obtuse; 3 to 4 in. long, 1.5 to 1.75 in. wide; thinly coriaceous; dark green, quite glabrous above, brownish-black and densely covered with black adpressed tomentum beneath; lateral nerves 5 pairs, oblique, distinct beneath not visible above, secondary venation indistinct beneath not visible above; petiole ·75 to 1 in. long, with close adpressed black tomentum. Flowers in few-flowered cymes, 25 in. across, disposed in narrow axillary panicles 3 to 6 in. long, 5 in. wide; main-rachis angular, densely rusty-pubescent, the peduncles of individual cymes 25 in. long or less, densely rustypubescent, as are the linear deciduous bracteoles 15 in. long, and the very short pedicels. Sepals orbicular, rusty-pubescent. Corolla white. ·3 in. across (but not quite fully opened), the lobes spreading, glabrous

within; interlobular spaces brown tomentose externally; lobules ovate, their margins sub-entire. Hallier f. Bull. Herb. Boiss. V. 737.

PERAK: Thaipeng, 500 to 800 feet elevation; King's Collector 8461!

2. ERYCIBE MAGNIFICA, Prain Journ. As. Soc. Beng. LXXIII. 2. 18. A strong creeper 80 to 100 feet long, stem 2 to 3 in, in diam.: old branches .75 in. in diam. still densely tomentose, quite cylindric, with large pith; branchlets 3 in. in diam., densely velvety with a tawny to rusty matted tomentum. Leaves elliptic or elliptic-obovate, with a narrowly truncate or rounded base, and an obtuse or sometimes retuse apex, the margin strongly revolute; 8 to 10 in. long, 3.5 to 4 in. wide; coriaceous; upper surface quite glabrous, dark green and shining with sometimes a silvery, sometimes a rich coppery sheen; under surface velvety, pale brownish-green, the tomentum longer, looser, and sometimes whitish on the main-nerves; lateral nerves rather straight, spreading, 12 to 15 pairs, rather distinctly looped along the margin, prominent beneath, deeply impressed above, as is the secondary reticulate venation; petiole 35 in. long, densely rusty-velvety. Flowers in short axillary racemes, sometimes clustered, of close-set 2-3-flowered individual cymules; the racemes 1 to 2 in. long; peduncles, short pedicels and small ovate bracts and bracteoles densely rusty-Sepals orbicular, densely velvety outside, quite glabrous within, coriaceous, in fruit 2 in. across. Corolla 5 in. across; lobes slightly spreading, glabrous within, and waxy white or yellow, narrow and deeply divided; interlobular spaces densely dark brown, almost black velvety-pubescent externally; lobules very small oblong. Fruit ellipsoid, 1.25 in. long, 1 in. in diam., densely softly velvety, of a rich brown colour.

PERAK: King's Collector 3454! 3879! 6721!

In the first of his three gatherings Kunstler has noted this as a tree 50 to 70 feet high, but in the two subsequent ones as a large creeper, which is, from the appearance of the specimens, undoubtedly the case with the first gathering also.

3. ERYCIBE EXPANSA, Wall. Cat. 1331. A large climber, branches angled, with fissured bark, glabrous; branchlets angular, densely rusty-tomentose. Leaves elliptic or slightly obovate, apex abruptly shortly acuminate to a sharp tip, base rounded or sub-cordate; 2 to 2.5 in. long, 1 to 1.5 in. wide; chartaceous; dark green, quite glabrous above, paler and rusty-pubescent, especially on the nerves, beneath, the pubescence ultimately disappearing except from the nerves in old leaves; lateral nerves 2 to 3 pairs, very oblique, ascending; secondary reticulate venation fairly visible above only; petioles 15 in. long, densely rusty-pubescent. Flowers in rather condensed 5-9-flowered cymes disposed in pyra-

midal terminal panicles 3 to 15 in. long, 1·5 to 6 in. wide, the main rachis and branches densely rusty-tomentose, the panicle branches ·75 to 2·5 in. long, subtended by large foliaceous bracts ·4 to 1 in. long, exactly like the foliage leaves but smaller; peduncles of individual cymes rusty-tomentose, ·25 in. long; pedicels bracteolate, ·1 in. long or less, rusty-tomentose. Sepals orbicular, rusty-pubescent. Corolla white, or white tinged with pink, ·45 in. wide; lobes spreading, glabrous within; interlobular spaces densely rusty-pubescent externally; lobules ovate acute, their margins sub-entire. G. Don Gen. Syst. IV. 392; Clarke in Hook. f. Flor. Brit. Ind. IV. 181; Prain Journ. As. Soc. Beng. LXIII. 2. 84; Hallier f. Bull. Herb. Boiss. V. 737. E. ferruginosa, Griff. Notul. IV. 283. E. paniculata, β. expansa, Choisy Ann. Sc. Nat. 2. I. 222; DC. Prod. IX. 464. E. coriacea, Kurz For. Flor. Burm. II. 213 partly (not of Wall.).

KEDAH: Lankawi, Curtis 2128!—DISTRIB. Tenasserim.

4. ERYCIBE PRINCEI, Wall. Cat. 1335. A large straggling bush with spreading branches, or a stout climber; branches glabrous, the bark more or less fissured but quite cylindric; branchlets densely rustytomentose, cylindric. Leaves obovate-oblong or rarely obovate-lanceolate, narrowed slightly to the narrowly truncate or sometimes rounded base, more abruptly to the shortly acuminate or acute apex, with an obtuse or occasionally acute tip; 2.5 to 4 in. long, 1.25 to 1.75 in. wide; coriaceous, shrinking somewhat irregularly when dry; glabrous rather pale green above, beneath at first rusty pubescent with a loose tomentum, which soon disappears except from the midrib; lateral nerves 5 to 7 pairs, very oblique and not very prominent on either surface, with a distinct sub-marginal looping vein; secondary reticulate venation distinct but not prominent on either surface; petiole 2 to ·25 in. long, rusty-pubescent. Flowers in axillary cymes in the uppermost leaf axils, 5-9-flowered, .75 in. wide, the ultimate 3 to 7 passing into a terminal panicle without leaves 1.5 to 3 in. long, rarely longer; peduncles 15 to 25 in. long, rusty-pubescent; pedicels very short and lanceolate bracteoles, 2 in. long, rusty-pubescent. Sepals orbicular, coriaceous, rusty-pubescent. Corolla greenish, sweet-scented, 4 in. across; lobes slightly spreading; interlobular spaces shining golden silky externally; lobules ovate, margins finely undulate. Fruit ellipsoid, black, smooth, 6 in. long, 35 in. in diam. Choisy in Ann. Sc. Nat. 2. I. 224; DC. Prod. IX. 464; Clarke in Hook, f. Flor. Brit. Ind. IV. 152; Prain Journ. As. Soc. Beng. LXIII. 2. 85; Hallier f. Bull. Herb. Boiss. V. 737 (excluding the Assam and Khasia localities), 1052. E. camptobotrya, Miq. Flor. Ind. Bat. Suppl. 578.

MALACCA: Griffith 5883 (K.D.)! Maingay 1155 (K.D.)! SINGA-

PORE: in hedges, frequent, Kurz 2968! Hullett 628! 642!—DISTRIB. Bangka, Sumatra, Borneo.

5. ERYCIBE MALACCENSIS, Clarke in Hook. f. Flor. Brit. Ind. IV. 182. A stout spreading shrub with straggling branches, or a climber extending to 100 feet in length; branches glabrous, with fissured bark, but cylindric; branchlets stellately puberulous, rather distinctly angled. Leaves elliptic, oblong or obovate-oblong, narrowed from the middle or beyond to the cuneate or narrowly truncate base and more abruptly to the shortly acuminate apex with obtuse tip; 3 to 3.5 in. long, 1.25 to 1.5 in. wide; thickly chartaceous; dark green, shining, quite glabrous above; paler glaucescent beneath and at first pubescent with a deciduous tomentum which soon disappears except from the rusty midrib; lateral nerves 5 to 6 pairs, usually very oblique, rather distinct on both surfaces as is the secondary reticulate venation; petiole 25 in. long, rusty-tomentose. Flowers in axillary 5-9-flowered cymes, 5 in. wide; peduncles 2 to 15 in. long, rusty-tomentose; bracteoles elliptic, fulvous-tomentose, small; pedicels 15 in. long, rusty. Sepals orbicular, fulvous-tomentose. Corolla glabrous within, white, :35 in. across; lobes slightly spreading; interlobular spaces fulvous-tomentose externally; lobules ovate, margins slightly undulate. Fruit ellipsoid, purple, ·75 in. long, ·5 in. in diam. with a faint apical areola, glabrous. Prain Journ. As. Soc. Beng. LXIII. 2. 85; Hallier f. Bull. Herb. Boiss. V. 738.

PERAK: Larut, King's Collector 3093! 3180! 3575! Scortechini 2196! Kota, Wray 2412! Penang: Maingay 1154! Malacca: Bukit Labukor, Ridley 3526! Batu Tiga, Derry 1042!—Distrib. Tenasserim.

6. ERYCIBE ANGULATA, Prain Journ. As. Soc. Beng. LXIII. 2. 84. A robust scandent shrub or a strong climber; stems sometimes over 100 feet long and 4 to 6 in. in diam.; branches terete, glabrous; ultimate branchlets angular, rusty-pubescent. Leaves obovate, base cuneate or rounded, apex shortly acuminate or rounded or sometimes deeply emarginate (normally shortly acuminate); 4 to 8 in. long, 2 to 4 in. wide; coriaceous, quite glabrous; lateral nerves 5 to 8 pairs, visible above, distinctly raised beneath; secondary venation indistinct; petioles ·5 in. long, rusty-pubescent. Flowers in few-flowered cymes disposed in axillary and terminal panicles with angular rachis clothed with darkred tomentum; axillary inflorescences 1 to 6 in. long, 1 to 1.5 in. wide, terminal 7 to 10 in. long, with sometimes floral leaves intermixed; pedicels bracteolate, 25 to 5 in. long. Sepals orbicular, outer stellately rusty-tomentose, inner ciliate. Corolla white, 5 in. wide; lobes spreading; interlobular spaces hirsute externally; lobules glabrous, ovate-oblong, with slightly undulate margins. Hallier f. Bull. Herb.

Boiss. V. 739. E. paniculata, Miq. Flor. Ind. Bat. Suppl. 248 (not of Roxb.).

Perak: Larut, King's Collector 7379! Dijong, Scortechini 1816!— Distrib. Sumatra (Teysmann 3682).

When originally describing this species the writer referred to it a Java specimen collected by Kurz; Dr. Hallier, however, whose knowledge of *Convolvulaceæ* is so profound, has shown that this Java specimen, which is not a very good one, belongs in reality to a distinct species—*E. macrophylla*, Hallier f.

7. ERYCIBE LEUCOXYLOIDES, King MSS. ex Ridl. in Herb. Singap.; Prain Journ, As. Soc. Beng, LXXIII. 2. 16. A very large climber with slender cylindric branches, bark fissured and covered with a close grey pubescence; branchlets numerous, very slender, rather distinctly angled, grey- or rusty-pubescent. Leaves sub-bifarious, ovate or ovate-lanceolate, base rounded, apex sub-acuminate or abruptly narrowed to an obtuse tip: 1 to 1.75 in. long. 4 to 6 in. wide; membranous or thinly chartaceous; quite glabrous on both surfaces; rather dark green above. paler beneath; secondary nerves about 3 pairs, very oblique and hardly visible above except in young leaves, not visible beneath even when dry and even when young; petiole 1 in. long, grey-pubescent. Flowers axillary, solitary; pedicels 2 in. long, somewhat recurved in fruit, greypubescent, bracteolate under the calvx. Sepals orbicular, sparsely pubescent on the centre externally, elsewhere glabrous except the ciliate margins. Corolla white, sweet-scented, 5 in. across; interlobular spaces brown-tomentose externally; lobules broad, semi-orbicular, entire. Fruit elliptic, black, smooth, glabrous, 6 in. long, 4 in. wide.

SINGAPORE: climbing in secondary jungle, *Hallier! Ridley* 2051, 6897! 10927! SELANGOR: Kwala Lumpar, *Curtis* 2402! Johore: *Ridley!*

8. Exycibe festiva, Prain Journ. As. Soc. Beng. LXIII. 2. 87. A climber, 60 to 70 feet long (Kunstler), or a small tree (Hullett); branches grooved but cylindric; ultimate branchlets slightly angular, sparingly pubescent. Leaves elliptic or oblong, base cuneate, apex usually rather long acuminate with an obtuse tip; 3 to 6 in. long, 1.5 to 2.5 in. wide; glabrous; thinly coriaceous; lateral nerves 7 to 9 pairs, distinct on both surfaces, especially beneath, secondary venation distinct beneath; petiole glabrous, 5 to 75 in. long. Flowers in short axillary 7-12-flowered cymes 5 to 75 in. across; peduncles 3 to 5 in. long, rusty-pubescent; pedicels rusty-pubescent, bracteolate, 12 in. long. Sepals orbicular, rusty-pubescent. Corolla pale greenish-white within, 75 in. across, lobes broad; interlobular spaces brown-tomentose externally; lobules ovate, margins erose, usually rather deeply, through-

out. Prain Journ. As. Soc. Beng. LXV. 2. 536; Hallier f. Bull. Herb Boiss. V. 739.

PERAK: in open forest in rocky localities, at 500 to 800 feet elevation, King's Collector 6445! SINGAPORE: garden jungle, Ridley 6043! Hullett!

9. ERYCIBE SAPOTACEA, Hallier f. & Prain Journ. As. Soc. Beng. LXXIII. 2. 16. A tree (?); branches slightly angled, with fissured bark, quite glabrous. Leaves elliptic, base cuneate, apex abruptly shortly acuminate with tip obtuse; 5 in. long, 2 to 2·25 in. wide; firmly coriaceous; quite glabrous on both sides; bright green and glossy above, pale beneath; lateral nerves 6 pairs, distinct above and rather prominent beneath, secondary reticulate venation very distinct on both surfaces; petiole '5 in. long, glabrous. Flowers in few-flowered congested, axillary subsessile cymes. Sepals and Corolla not seen. Fruit ovoid, quite glabrous, the epicarp very coriaceous, almost woody, wrinkled and fissured, with a rounded base and conical pointed apex, 2 in. long, 1 in. in diam.; fruiting pedicels '3 in. long, with epidermis fissured like that on the branches.

Penang: Government Hill, Curtis 772!

A very distinct and striking species, the flowers of which are as yet unknown. In shape the fruit is most like that of *E. Griffithii*, but besides being about twice the size it has none of the scurfy covering of the fruit of that species. The leaves of the two are very different.

10. ERYCIBE STAPFIANA, Prain Journ. As. Soc. Beng. LXIII. 2. 87. A shrubby or slender climber, sometimes 80 to 100 feet long; much branched; branches and glabrous branchlets cylindric. Leaves usually oblong or elliptic, rarely narrowly lanceolate, narrowed to a cuneate or narrowly truncate base, apex shortly acuminate with a blunt tip; 4 to 7 in. long, 2 to 3 in. wide; coriaceous; glabrous; dark green and glossy above, paler beneath; lateral nerves 4 to 6 pairs, ascending obliquely, the lowest pairs extending more than half-way along the margin, the secondary veins reticulately raised beneath, visible but not conspicuous above; petiole .25 in. long, glabrous. Flowers in clustered axillary cymes 5 to 2 in. long, in fascicles of 4 to 9 from a woody protuberance, each 5-20-flowered; peduncles densely dark-brown-tomentose, as are the bracteolate pedicels, 1 to 15 in long. Sepals orbicular, densely brown-tomentose. Corolla waxy-white within, 5 in. across; lobes narrow; interlobular spaces very dark-brown-tomentose (nearly black-Kunstler) externally; lobules narrow, divergent, slightly crenulate along the obliquely truncate apex. Fruit ovoid, 6 to 8 in. long, 5 in. in diam., densely clothed with a fine dark-brown velvety tomentum. Hallier f. Bull. Herb. Boiss. V. 738.

PERAK: at various elevations from 300 to 4,000 feet, King's Collector 4015! 4115! 7784! Wray 3371! Scortechini 1793!—DISTRIB. Tenasserim (Parish).

11. ERYCIBE PRECIPUA, Prain Journ. As. Soc. Beng. LXIII. 2. 86. A large climbing shrub; branches and ultimate branchlets cylindric, glabrous. Leaves narrowly elliptic to elliptic, narrowed to the cuneate base and more abruptly to the obtuse tip; thickly coriaceous; quite glabrous; 1.5 to 4 in. long, .75 to 2 in. wide; nerves about 5 pairs, curved and ascending, but all very obscure even when dry; petioles .3 in. long, glabrous. Flowers in small, axillary, laxly 5-8-flowered cymes .5 in. across; peduncles and bracteolate pedicels closely rusty-pubescent, pedicels .12 in. long. Sepals orbicular, the outer minutely, the inner densely closely rusty-pubescent. Corolla whitish, .5 in. wide, the lobes very narrow, spreading; interlobular spaces rufous-pubescent internally as well as externally; lobules small glabrous, narrowly oblong, sub-acute, divergent. Fruit ovoid, slightly rough but not verrucose, .7 to .75 in. long, .5 to .6 in. wide, pointed or rounded.

Penang: Government Hill, Curtis 911! 1273! Perak: Larut, Scortechini!

Father Scortechini's specimens from Perak have the fruit slightly smaller, not at all pointed, and not so distinctly roughened as the Penang specimens, but in all other respects the two plants agree.

12. ERYCIBE GLOMERATA, Bl. Bijdr. 1047. A shrub or a small tree, 10 to 20 feet high, erect, much spreading; branches and sparingly pubescent ultimate branchlets cylindric. Leaves elliptic or narrowoblong, shortly or gradually narrowed to the cuneate base and to the obtuse tip; 7 to 12 in. long, 1.75 to 5 in. wide; coriaceous; quite glabrous; dark green above, waxy-pale greenish-yellow (Kunstler) beneath; lateral nerves 8 to 9 pairs, visible but not raised on either surface or only faintly raised beneath; petiole 15 to 35 in. long. Flowers in axillary very short and closely glomerate 5-8-flowered cymes; peduncles :05 in. long; individual flowers nearly sessile with 3 rusty-pubescent bracteoles at the base of the calyx. Sepals almost glabrous, pale waxygreen (Kunstler), orbicular, margins ciliate. Corolla pure white within, 1.25 in. across; lobes narrow; interlobular spaces rufous externally; lobules oblong, obtuse, slightly crenulate at the apex. Hallier f. Bull. Herb. Boiss. V. 382, 739. E. albida, Prain Journ. As. Soc. Beng. LXIII. 2. 87.

VAR. typica; leaves elliptic, 3.5 to 5 in. wide.

Perak: on Gunong Bubu, 2,500 to 3,000 feet, King's Collector 7373! Larut, Scortechini! Pungah: Curtis 2947!—Distrib. Java.

VAR. longifolia, Bl. Bijdr. 1047; leaves cuneate-oblong, obtusely acuminate, 1.75 to 2.25 in. wide. E. angustifolia, Hallier f. Engl. Bot. Jahrb. XVI. 524.

Perak: Waterfall Hill, Wray 2580! Malacca: Bujong, Scortechini 1908!—Distrib. Java, Borneo.

13. ERYCIBE AENEA, Prain Journ. As. Soc. Beng. LXIII. 2. 85. A very large climber; stems 70 to 150 feet long, 3 to 4 in. in diam.; branches and densely rusty-tomentose branchlets cylindric. Leaves narrowly oblong or elliptic, base cuneate, apex gradually or oftener abruptly narrowed to an obtuse tip; thickly coriaceous; quite glabrous; 2.5 to 5 in. long, 1 to 2 in. wide; lateral nerves 5 to 6 pairs with a distinct sub-marginal connecting nerve, impressed on both surfaces but especially beneath; petiole .25 in. or less. Flowers in axillary 3-20-flowered cymes .25 to 1.2 in. long; peduncles and bracteolate pedicels minutely closely rusty-tomentose; pedicels .12 in. long. Sepals orbicular, closely brown-tomentose. Corolla pale yellow, .5 in. across, the lobes spreading; interlobular spaces pale brown-tomentose externally; lobules ovate-oblong, their margins undulate. Fruit elliptic, verrucose, grey, .9 in. long, .5 to .6 in. wide. Hallier f. Bull. Hort. Boiss. V. 739.

PERAK: Larut, at elevations of from 300 to 2,500 feet, King's Collector 7337! 8165!

14. ERYCIBE GRIFFITHII, Clarke in Hook. f. Flor. Brit. Ind. IV. 182. A climber 60 to 80 feet long; stem 4 to 6 in. in diam.; branches cylindric, glabrous; branchlets cylindric, sparingly rusty-pubescent. Leaves elliptic, rarely ovate-lanceolate or obovate-oblong, base cuneate or rarely rounded, apex usually abruptly acuminate, less often gradually narrowed to the obtuse tip; 2.75 to 6 in. long, .75 to 2.5 in. wide; quite glabrous on both surfaces, sub-coriaceous; lateral nerves 6 to 8 pairs, very oblique, visible but not prominent above, prominent beneath; secondary venation very indistinct; petiole 25 to 3 in. long, glabrous. Flowers in short axillary solitary or clustered 4-9-flowered cymes 3 in. across; peduncles rusty-pubescent, 2 to 3 in. long; pedicels 25 in. long, rusty-pubescent as are the very minute ovate-lanceolate bracteoles. Sepals orbicular, rusty-pubescent externally. Corolla waxy creamcoloured and glabrous within, 5 in. across, the lobes spreading, narrow and stellate; interlobular spaces rusty-brown externally; lobules narrow acute, their margins sub-entire. Fruit coriaceous, greyish-brown and closely scurfy externally, 1 to 1.5 in. long, 5 to 75 in. wide. Prain Journ. As. Soc. Beng. LXIII. 85; Hallier f. Verslag. Buitenzorg, 1895. 126; Bull. Herb. Boiss. V. 738, 1052. E. Maingayi, Clarke in Hook. f. Flor. Brit. Ind. IV. 182; Hallier f. Bull. Herb. Boiss. V. 737. E. micrantha, Hallier f. Engl. Bot. Jahrb. XVI. 524.

PERAK: Larut, 200 to 300 feet elevation, King's Collector 8191!

Scortechini! Malacca: Maingay. Penang: Gaudichaud 120; Curtis
181! King's Collector 1458!—Distrib. Tenasserim, Sumatra,
Philippines.

3. Porana, Burm.

Large climbers. Leaves petioled, ovate or cordate, entire. Flowers small; cymes often in large panicles; bracts persistent; bracteoles subulate or 0. Sepals 5, small and narrow in flower; in fruit the outer 3 or all 5 much accrescent, membranous and spreading, usually spathulate. Corolla white, campanulate or infundibuliform with a wide or narrow throat; limb spreading plicate, sub-entire or 5-lobed. Stamens 5, adnate to corolla-tube, sub-included; filaments linear or filiform. Ovary 2-celled or 1-celled; ovules 4 or 2; style long or short, entire or 2-fid; stigma solitary 2-lobed, or stigmas 2, capitate. Fruit globose oblong or obconic, 1-seeded, membranous, indehiscent or opening by 2 valves. Seed glabrous; cotyledons plicate.—Distrib. Species about 10, throughout S.E. Asia.

Porana volubilis, Burm. Fl. Ind. 51. t. 21. f. 1. A large climber; stems and warted branches glabrous, young shoots pubescent. Leaves glabrous, ovate sub-cordate, or sometimes base rounded, apex shortly acuminate, quite glabrous, 2.5 in. long, 1.5 in. wide; petiole 6 in. long. Flowers white, small, in sub-ebracteate cymes disposed in panicles 12 to 15 in. long, minutely tawny-pubescent; pedicels 1 to 25 in. long. Sepals 5, minutely pubescent, in flower 2 in. long, oblong; in fruit 35 in. long, sub-spathulate, all equal. Corolla 3 in. long; tube narrow; limb rather distinctly 5-lobed. Stamens 5, included. Ovary 2-celled; ovules 4; style 2-partite; stigmas small, capitate. Fruit a globose capsule, enclosed in the accrescent 5-7-nerved calyx-lobes, 15 in. in diam. Seed solitary. Lamk Ill. t. 186; Roxb. Fl. Ind. ed. Carey & Wall. II. 40; ed. orig. I. 465; Blume Bijdr. 723; Wall. Cat. 1327; Choisy Convolv. Or. 106, and in DC. Prod. IX. 436; Clarke in Hook. f. Flor, Brit. Ind. IV. 222.

Malacca: Griffith! King!—DISTRIB. Indo-China, Malay Archipelago.

King's examples are from a cultivated plant; whether those of Griffith be from wild plants is unknown.

4. Neuropeltis, Wall.

Large scandent, tomentose shrubs. Leaves ovate or oblong, firm, petioled. Flowers many, small, in axillary racemes or terminal panicles; pedicels distinct, beset by solitary ovate-lanceolate bracteoles under the calyx, in flower inconspicuous, in fruit greatly accrescent.

Sepals 5, sub-orbicular, hardly altered in fruit. Corolla small, white; tube wide-campanulate; limb deeply 5-lobed, the lobes induplicate-valvate in bud. Stamens 5, exserted or included, adnate to corollatube; filaments filiform. Ovary imperfectly or perfectly 2-celled; ovules 4; styles 2, free throughout, stigmas sub-capitate wavy or obscurely lobed. Fruit a globose, 4-valved, 1-seeded capsule sessile near the centre of the flat, much-accrescent bracteole. Seed globose, glabrous, albuminous; cotyledons plicate.—Distrib. Species 2, in tropics of Eastern Hemisphere.

NEUROPELTIS RACEMOSA, Wall. Cat. 1322. A robust climber: branchlets pubescent, lenticellate, rather dark. Leaves alternate. elliptic-lanceolate, base cuneate, apex acuminate with a narrow longish thickened mucro; lamina 2.5 to 5 in. long, 1.25 to 2.25 in. wide; firmly papery; glabrous except along the midrib above, slightly rusty with a sub-persistent pubescence beneath; lateral nerves about 7-paired, somewhat curved forward, rather prominent and pubescent beneath. Flowers in axillary racemes 2 to 5 in. long, peduncle 5 to 1 in. and rachis rusty-tomentose; bracts small ovate; pedicels 12 to 2 in. long, tomentose, slender, with an ovate-lanceolate bracteole under the calyx. Sepals 5, somewhat connate below, small, orbicular, rufous-villous. Corolla small, campanulate, white, tube rufous-villous externally; limb 25 to 3 in. across, 5-lobed, lobes ovate nearly as long as the tube. Stamens 5, adnate to corolla-tube, exserted; filaments thickened at base. Ovary imperfectly or perfectly 2-celled, rufousvillous at base; ovules 2 in each cell; styles 2, glabrous; stigmas large globose wavy. Capsule 25 in. long, ovoid, glabrescent, sessile in the centre of the accrescent, orbicular, scarious, reticulate bract 1 to 1.75 in. wide with rounded or cordate base. Seed globose, glabrous, albuminous; cotyledons plicate. Roxb. Flor. Ind. ed. Carey & Wall. II. 44; Deless. Ic. Select. V. t. 96; Choisy Convolv. Or. 109, t. 2. f. 12, and in DC. Prod. IX. 437; Bedd. Ic. Pl. Ind. Or. t. 291; Kurz For. Flor. Burm. II. 222; Clarke in Hook f. Flor. Brit. Ind. IV. 225. N. ovata, Wall. Cat. 1323; Choisy Convolv. Or. 110, t. 2, f. 13, and in DC. Prod. IX. 437. N. bracteata, Griff. Notul. IV. 285. N. intermedia, Griff. Notul. IV. 285.

Perak: Larut, Scortechini 1483! 1489! 2071! King's Collector 3544! 3792! 4370! 6809! Penang: Wallich! Malacca: Maingay 1152! 1153! Singapore: Wallich!—Distrib. Malabar, Borneo.

5. Evolvulus, Linn.

Small prostrate or erect herbs or undershrubs, never climbing. Leaves small, entire, often distichous. Flowers small, blueish or white,

in axillary few-flowered peduncled or sub-sessile cymes. Sepals 5, small, sub-equal, not enlarged in fruit. Corolla small, funnel-shaped or sub-rotate; limb plicate, sub-entire. Stamens 5, included or exserted; filaments filiform. Ovary 2-celled or, rarely, 1-celled; ovules 4; styles 2, free from the base, each cleft into 2 linear or sub-clavate stigmas, papillose on the inner face. Fruit a 4-valved, less often a 2-valved capsule, 2-celled or 1-celled. Seeds 4 or 2, rarely solitary, glabrous; cotyledons twice plicate.—Distrib. Species about 80, mostly tropical American; the present the only Asiatic.

EVOLVULUS ALSINOIDES, Linn. Sp. Pl. ed. II. 392. A small perennial herb; annual branches numerous, wiry, often prostrate. Leaves variable in shape from lanceolate to ovate, and in pubescence from sparingly silky to densely tawny or rufous-tomentose; 25 to 1 in. or occasionally 1.5 in. long, 2 to 5 in. wide; petiole absent or short, rarely 2 in. long. Flowers 1 to 3, on peduncles 1 in. to 1 or 1.5 in. long; bracts small, linear, hirsute, persistent; pedicels 05 to 5 in. long. Sepals 5, lanceolate, hirsute, 1 to 15 in. long. Corolla pale blue or white, transparent, 25 to 3 in. long. Capsule globose, 15 in. in diam., 4-valved. Seeds 4, glabrous. Burm. Fl. Zeyl. 9, t. 6, f. 1; Wall. Cat. 1317; Roxb. Flor. Ind. II. 105; Choisy in DC. Prod. IX. 447; Clarke in Hook f. Flor. Brit. Ind. IV. 220. E. linifolius, Linn. Sp. Pl. ed. II. 392; Choisy in DC. Prod. IX. 449. E. angustifolius, Roxb. Flor. Ind. ed. Carey & Wall. II. 107. E. hirsutus, Lamk Encyc. Meth. III. 538; Ill. t. 216, f. 2; Choisy in DC, Prod. IX, 447, excl. syn. Roxb. E. sericeus, Wall. Cat. 1315. Convolvulus valerianoides, Blanco Fl. Filip. 90.

NICOBARS: Kamorta, Kurz! SINGAPORE: Changi, Ridley!—DISTRIB. Cosmopolitan in the tropics.

The form recorded from the Nicobars and Singapore is the narrow-leaved form, which is E. linifolius Linn. In both localities it is probably an introduced weed.

6. Bonamia, Thouars.

Large climbing shrubs. Leaves large ovate-cordate, entire, firm. Flowers medium, in axillary peduncled cymes; bracts small. Sepals 5, sub-equal, firm, ovate. Corolla infundibuliform, tube hirsute externally except opposite the sepals; limb 5-lobed, plicate. Stamens, 5, included, adnate to corolla-tube; filaments filiform, at least in upper part. Ovary 2-celled; ovules 4; style 2-fid to the middle; stigmas 2, capitate. Fruit a globose or ovoid capsule; valves thin, splitting irregularly at their apices. Seeds normally 4, glabrous or nearly so.—Distrib. Species about 30, throughout the tropics.

Bonamia semidigyna, Hallier f. Engl. Bot. Jahrb. XVI. 528. A large twining shrub; stems and leaves rusty-tomentose. Leaves ovate-cordate, entire, apex acute; length 4 in., width 2.5 in.; petiole 1.5 in. long. Flowers medium, in axillary sub-capitate 2-5-flowered cymes; peduncles 1 to 2 in. long, rusty-villous as are the pedicels and sepals; bracts 25 in. long, oblong, rusty-villous. Sepals 35 to 5 in. long, ovate-oblong, sub-acute, sub-equal. Corolla yellowish, wideinfundibuliform, 1.5 in. long; tube hirsute externally; limb sub-entire. Style ·6 in. long. Capsule sub-globose, glabrous, ·5 in. in diam., splitting into many vertical segments, hardly covered by the slightly accrescent, ovate fruiting sepals. Seeds sub-glabrous. Bull. Herb. Boiss. V. 1814. Convolvulus semidigynus, Roxb. Hort. Beng. 13; Flor. Ind. I. 468; Wall. Cat. 1405. Breweria cordata, Bl. Bijdr. 722; Choisy in DC. Prod. IX. 438; Clarke in Hook. f. Flor. Brit. Ind. IV. 223. B. Roxburghii, Choisy Convolv. Or. III., and in DC. Prod. IX. 438; Wight, Ic. t. 1370; Dalz & Gibs. Bomb. Fl. 162. B. madagascariensis, Choisy Mem. Soc. Phys. Genev. 493.

Prov. Wellesley: at Kubang Ulu, Curtis! Penang: on the coast, Porter! Curtis 1703! Perak: Ipoh, Curtis 3166!—Distrib. S.E. Asia generally, Mascarenes.

7. CALYSTEGIA, R. Br.

Prostrate or twining perennial herbs. Leaves entire or lobed, glabrous or nearly so. Flowers medium, axillary solitary or rarely in few-flowered cymes; bracts 2, large, leafy, embracing the calyx, persistent. Sepals 5, ovate or oblong, the innermost 2 rather the smallest. Corolla funnel-shaped or campanulate; tube glabrous externally with 5 bands in centre of component petals, each with 5 pellucid lines at the base; limb sub-entire plicate. Stamens 5, adnate to corolla-tube, included; filaments sub-equal. Ovary 1-celled or imperfectly 2-celled; ovules 4; style filiform, entire; stigma of 2 oblong lobes. Fruit a globose, 1-celled, 4-valved, 4-seeded capsule. Seeds black, glabrous or verrucose.—Distrib. Species 16 to 20, in warm and temperate regions.

Calystegia hederacea Wall. Cat. 1328. A prostrate or climbing weed of cultivated places and hedges. Leaves somewhat irregular, cordate or sagittate, lobed or rarely entire, 1 to 3 in. long, '75 to 1 in. wide; petiole 1 in. long. Flowers axillary solitary; peduncles 1 in. long; bracts 2 ovate, '3 in. across, persistent, enclosing the calyx. Sepals 5, oblong, obtuse, glabrous, outer '3 in. long, inner rather smaller. Corolla sub-campanulate, pinkish purple, tube 1 in. long; limb plicate, sub-entire. Capsule ovoid, sub-acute, glabrous, '3 in. long.

Seeds glabrous. Roxb. Flor. Ind. ed. Carey & Wall. II. 94; Choisy Convolv. Or. 103, and in DC. Prod. IX. 434; Clarke in Hook. f. Flor. Brit. Ind. IV. 217. Convolvulus Wallichianus, Spreng. Syst. cur. post. 61.

Penang: Porter, fide Wallich.—Distrib. Northern India, Afghanistan, Eastern Asia.

Possibly only a casual weed in our area.

8. Hewittia, W. & A.

A pubescent twining herb. Leaves cordate, entire angled or lobed. Flowers axillary solitary, or in few-flowered cymes; bracts below the calyx 2, linear-lanceolate. Sepals 5, acute; outer 3 wide-ovate, accrescent in fruit, inner 2 narrow-lanceolate. Corolla medium, yellow or white with a purple eye; tube campanulate; limb plicate. Stamens 5, included, adnate to corolla-tube; filaments linear with dilated bases. Ovary 1-celled or imperfectly 2-celled; ovules 4; style filiform; stigma of 2 ovate-oblong lobes. Fruit a globose, 4-valved, 1-celled, normally 4-seeded capsule. Seeds black, glabrous.—Distrib. A single species, throughout the tropics of the Eastern Hemisphere and Polynesia.

HEWITTIA BICOLOR, Wight Ic. t. 835. A pubescent perennial herb; stems twining. Leaves cordate, entire angled or lobed, pubescent. 2 to 4 in. long; petiole · 5 in. long. Flowers on axillary 1-few-flowered peduncles 5 to 4 in, long; bracts 2, narrow-lanceolate, 25 to 5 in. long, situated a short distance below the calyx. Sepals 5, the outer ovate, accrescent; the inner narrowly lanceolate, 3 to 5 in. long. Corolla yellow or whitish with a purple patch in lower part of tube, rather widely campanulate, 1 in. long; tube externally hirsute; lobes 5, very short. Stamens 5, included; filaments linear with dilated bases. Ovary hirsute, more or less perfectly 2-celled; ovules 4; style filiform; stigmas 2, ovate-oblong. Fruit a globose capsule, 25 in. in diam., 1-celled, opening by 4 valves. Seeds 4, black, glabrous. Wight Ill. t. 168; Clarke in Hook. f. Flor. Brit. Ind. IV. 216. Convolvulus bicolor, Vahl. Symb. III. 25; Bot. Mag. t. 2205; Roxb. Hort. Beng. 14; Flor. Ind. I. 475; Flor. Ind. ed. Carey & Wall. II. 57; Wall. Cat. 1410. C. bracteatus, Vahl Symb. III. 25. C. involucratus, Ker in Bot. Reg. t. 318 (not of Spreng.). Ipomæa bicolor, Sweet Hort. Brit. ed. 2, 372. I. bracteata, Bl. Bijdr. 711 (not of Willd. nor of Wight). I. Weinmanni Roem. & Schult. Syst. Nat. IV. 243. Calystegia Keriana, Sweet Hort. Brit. ed. 2, 370. Palmia bicolor, Endl. ex Dalz. & Gibs. Bomb. Flor. 163. Shuteria bicolor, Choisy Convolv. Or. 104, and in DC. Prod. IX. 435; Flor. des Serres t. 421. Aniseia Afzelii, G. Don Gen. Syst. IV. 295. A. bracteata, Hassk. Pl. Jav. Rar. 516.

Perak: Larut, Scortechini !—Distrib. Tropical Africa, S.E. Asia generally, Polynesia.

9. Aniseia, Choisy.

Twining herbs. Leaves elliptic, mucronulate or lanceolate. Flowers axillary, solitary or in few-flowered cymes. Sepals 5, herbaceous, acuminate; outer 3 the larger, ovate, decurrent on the peduncle and accrescent in fruit; inner 2 smaller, lanceolate, unaltered in fruit. Corolla wide-infundibiliform; tube hirsute externally except on spaces opposite the sepals, with 5 distinct vertical bands; limb sub-entire. Stamens 5, adnate to corolla-tube, included; filaments filiform. Ovary glabrous, 2-celled; ovules 4; style filiform; stigma 2-globose. Fruit a 2-celled, 4-valved capsule. Seeds 4, large, black, smooth.—Distrib. Species about 5, all confined to America but one, which is cosmopolitan in the tropics.

Aniseia Martinicensis, Choisy Convolv. Rar. 144. A slender herb creeping in wet places or climbing, glabrous or with a few adpressed hairs. Leaves oblong-lanceolate, apex obtuse with a mucro, base cuneate; glabrescent; .75 to 3 in. long, .5 to 1 in. wide; petiole .6 in. long. Flowers axillary solitary; peduncles 1 in. long, with 2 minute, persistent bracts about the middle. Sepals unequal, the outer ovate-acute ·6 in. long, the inner narrower, green, glabrescent; in fruit accrescent at length .75 to 1 in. long, the 2 outer then sub-cordate-ovate scarious, strongly nerved, decurrent on the peduncle; the inner lanceolate. Corolla white, campanulate, tube 1 in. long, pubescent outside; limb 1 in. across. Capsule ovoid, glabrous, 5 in. long. Seeds with minutely strigose margins. Choisy in DC. Prod. IX. 430; Hallier f. Engl. Bot. Jahrb. XVIII. 96, and Bull. Herb. Boiss. V. 382. A. uniflora, Choisy Convolv. Or. 101, t. 2, f. 9, and in DC. Prod. IX. 431; Wight Ic. t. 850. Convolvulus martinicensis, Jacq. Am. 20, t. 17. C. uniflorus, Lamk Encyc. Meth. III. 544; Burm. Fl. Ind. 47, t. 21. C. emarginatus, Vahl Symb. III. 23. C. Rheedei, Wall. Cat. 1358; Roxb. Flor. Ind. ed. Carey & Wall. II. 70. Ipomæa martinicensis, Mez Prim. Fl. Esseq. 98. I. uniflora, Roem. & Schult. Symb. IV. 247; Clarke in Hook. f. Flor. Brit. Ind. IV. 201. I. lanceolata, G. Don Gen. Syst. IV. 282.

Perak: Kwala Dipong, Scortechini 1780! Kota Bahru, King's Collector 1075! MALACCA: Griffith!—DISTRIB. Tropics generally.

10. JACQUEMONTIA, Choisy.

Climbing or twining herbs or undershrubs; stems and leaves usually pubescent. Leaves usually cordate or elliptic, entire or rarely toothed or lobed. Flowers axillary, in compound umbellate or capitate

cymes, very rarely solitary; bracts small, rarely leafy. Sepals 5, equal or unequal. Corolla usually small; tube infundibuliform with a wide or narrow throat, and with 5 vertical bands each ending in 2 distinct nerves; limb plicate. Stamens 5, adnate to corolla-tube, included. Ovary glabrous, 2-celled; ovules 4; style filiform; stigmas 2, linear or elliptic-oblong. Fruit a globose 2-celled capsule, usually 8-valved, rarely 4-valved. Seeds normally 4, usually glabrous, often slightly winged along the margins.—Distrib. Species 60 to 70, mostly in Brazil; 2 to 3 in S.E. Asia.

JACQUEMONTIA PANICULATA, Hallier f. Engl. Bot. Jahrb. XVI. 541; XVIII. 95. A slender climber; stems twining, puberulous. Leaves ovate-cordate, acute, entire, pubescent beneath, puberulous at length glabrescent above, 1.5 to 3 in. long, 1 to 2 in. wide; petiole 5 to 1 in. long. Flowers axillary, in small dense many-flowered sub-capitate cymes; peduncles puberulous, 1 to 1.5 in. long; bracts inconspicuous. Sepals 5, ovate-cordate, pubescent, 25 in. long, not altered in fruit. Corolla tubular, 5 in. long; mouth narrow, limb pink or white, shortly acutely 5-lobed. Capsule globose, glabrous, 2 in. in diam. Seeds glabrous. Convolvulus parviflorus, Vahl. Symb. III. 29; Roxb. Flor. Ind. ed. Carey & Wall. II. 51; Choisy Convolv. Or. 98, and in DC. Prod. IX. 413; Clarke in Hook. f. Flor. Brit. Ind. IV. 220. C. asclepiadeus, Wall. Cat. 1396. Ipomæa paniculata, Burm. Flor. Ind. 50, t. 21, f. 3. I. parviflora, Pers. Synops. I. 183 (not of Vahl.).

Perak: Kampong Kota, Wray 3337!—Distrib. Tropical Africa, S.E. Asia generally, Australia.

11. Merremia, Dennst.

Shrubs or herbs, usually climbing, rarely erect or prostrate; stems very rarely winged. Leaves entire, lobed, or divided. Flowers axillary, usually long-peduncled, solitary or in few-flowered, rarely many-flowered cymes; bracts small. Sepals 5, sub-equal, elliptic or lanceolate, acuminate, rarely rounded or truncate, convex, usually slightly accrescent in fruit. Corolla campanulate, white, less often yellow or orange, the tube with 5 vertical bands each usually marked by 5 dark-violet lines; limb plicate, margin slightly 5-lobed. Stamens 5, unequal, included or exserted; filaments filiform; anthers usually twisted; pollen never spinulose. Ovary 2-celled or occasionally 4-celled; ovules 4; style filiform; stigma 2-globose. Fruit a 4-valved capsule, 1-4-locular, sometimes the style separating with a small stopple. Seeds 4, rarely fewer, dull, glabrous, rarely puberulous.—Distrib. Species about 40, in all warm countries.

Corolla glabrous externally:-Leaves not peltate :-Leaves deeply 5-lobed; flowers large 1. M. vitifolia. Leaves entire or very slightly lobed: flowers small:-Sepals acuminate; flowers yellow with a pink or purple eve:--.. 2. M. hastata. Leaves acute at apex-Leaves obtuse, truncate, or 3-toothed at apex .. 3. M. tridentata. Sepals obtuse: flowers without a distinct eye:-Leaves narrow-oblong, the lower often ovate-oblong; flowers white with pinkish tinge or yellowish-white or 4. M. cæspitosa. Leaves ovate-cordate, margin often crenate or toothed; flowers clear yellow .. 5. M. convolvulacea. Leaves peltate; flowers large 6. M. nymphaeifolia. Corolla somewhat hirsute or shaggy externally:-Leaves more or less hirsute; flowers in compact corymbose or umbellate cymes 7. M. umbellata. Leaves quite glabrous; flowers in lax cymes .. 8. M. crispatula.

1. Merremia vitifolia, Hallier f. Engl. Bot. Jahrb. XVI. 552. A large climber with slender hispidly hairy branches. Leaves cordate, palmately 5-lobed, 2 to 6 in. across; lobes triangular acute, often toothed or again acutely lobed; petiole 5 to 2 in. long, hispidly hairy. Flowers in axillary 1-7-flowered cymes; peduncles hispidly hairy, 1 to 4 in. long, pedicels hispidly hairy, 2 to 5 in. long. Sepals ovateacute, hispid, 5 in. long, in fruit somewhat enlarged, 75 in. long. Corolla campanulate, clear yellow, glabrous, 1.5 in. long and nearly as wide, slightly irregular. Capsule depressed-globose, membranous. 2-celled, normally 4-seeded. Seeds glabrous. Verslag. Buitenzorg, 1895, 127, and Bull. Herb. Boiss. V. 379. Convolvulus vitifolius, Burm. Fl. Ind. 45. t. 18, f. 1; Linn. Mantiss. 203; Roxb. Hort. Beng. 14; Flor. Ind. I. 476, and ed. Carey & Wall. II. 61; Wall. Cat. 1348. C. angularis, Burm. Fl. Ind. 46, t. 19, f. 2; Linn. Mantiss. 203; Hassk. Pl. Jav. Rar. 519. Ipomæa vitifolia, Sweet Hort. Brit. ed. II. 372; Blume Bijdr. 709; Choisy Convolv. Or. 72, and in DC. Prod. IX. 361; Kurz For. Flor. Burm. II. 219; Clarke in Hook. f. Flor. Brit. Ind. IV. 213. I. angularis, Choisy Convolv. Or. 72.

PERAK: Larut, Scortechini! Andamans: Port Mouat, Kurz! Narcondam, Prain! Nicobars: Nancowry, Prain's Collector!— DISTRIB. S.E. Asia generally.

2. Merremia hastata, Hallier f. Engl. Bot. Jahrb. XVI. 552. A diffuse twining biennial herb, stem angular. Leaves glabrous, hastatelanceolate, 2 to 3 in. long, 3 to 5 in. wide, apex acute; petiole very short. Flowers 1 to 3 on wiry axillary peduncles as long as or longer than the leaves; bracts very small, lanceolate. Sepals narrow,

acuminate, ·3 to ·5 in. long, glabrous. Corolla funnel-shaped, ·6 in. long, pale yellow with a purple eye; limb slightly lobed. Stamens 5; filaments slightly hairy at the base; anthers straight. Ovary and style glabrous; ovary 2-celled, each cell 2-ovuled. Capsule ovoid, papery, glabrous, 2-celled. Seeds glabrous. Engl. Bot. Jahrb. XVIII. 117. Convolvulus hastatus, Desr. in Lamk Encyc. Meth. III. 547. C. filicaulis, Vahl Symb. III. 24. C. denticulatus, Spreng. Syst. I. 603. C. medius, Roxb. Flor. Ind. I. 474, and ed. Carey & Wall. II. 56; Wall. Cat. 1346 (not of Linn.). C. Blumei, Dietr. Syn. Pl. I. 675. Ipomæa denticulata, R. Br. Prod. I. 485; Bot. Reg. t. 317 (not of Choisy). I. filicaulis, Bl. Bijdr. 721; Choisy Convolv. Or. 66; DC. Prod. IX. 353. I. Blumei, Steud. Nomencl. I. 815. I. angustifolia, Clarke in Hook. f. Flor. Brit. Ind. IV. 205 (not of Jacq., nor of Choisy). Rheede Hort. Malab. XI. t. 55.

Perak: Larut, Scortechini 138! 1833! Kwala, &c., Wray 859! 1751! Sungah Ryah, King's Collector 996! Penang: Batu Gaja, &c., Deschamps! Malacca: Griffith! Tanjong Kling and Bukit Bruang, Hervey! Pahang: Pekan, Ridley! Katapang, Ridley 1236! Singapore: Hullett 69! 232! King's Collector 1174! King!—Distrib. Throughout S.E. Asia, Tropical Africa, and Australia.

3. Merremia tridentata, Hallier f. Engl. Bot. Jahrb. XVI. 552. A diffuse glabrous herb with a woody rootstock giving off many closely decumbent elongated stems. Leaves glabrous, hastate-oblong, or spathulate-linear, or sub-quadrate, '5 to '8 in. long, '15 to '5 in. wide, apex obtuse truncate or 3-toothed; petiole 0. Flowers 1 to 3 on wiry axillary peduncles as long as or longer than the leaves; bracts very small, lanceolate. Sepals ovate, acuminate, '25 to '35 in. long. Corolla funnel-shaped, '4 to '5 in. long, yellow with pink eye; limb slightly lobed. Stamens 5. Capsule ovoid, papery, glabrous, 2-celled. Seeds glabrous. Engl. Bot. Jahrb. XVIII. 116. Convolvulus tridentatus, Linn. Sp. Pl. 157; Roxb. Fl. Ind. I. 475, and ed. Carey & Wall. II. 56; Wall. Cat. 1347. Evolvulus tridentatus, Linn. Sp. Pl. ed. II. 392. Ipomea tridentata, Roth Cat. Bot. II. 19; Choisy Convolv. Or. 65, and in DC. Prod. IX. 353; Clarke in Hook. f. Flor. Brit. Ind. IV. 205.

Malacca: Griffith 5861/1 (K.D.)! Maingay 1147 (K.D.)! Johore: Batu Pahat, Ridley 11,114!—DISTRIB. India generally, Africa, Bangka.

4. Merremia cæspitosa, Hallier f. Engl. Bot. Jahrb. XVI. 552. A sparsely hairy or glabrescent annual or biennial slender twining or creeping herb. Leaves narrowly oblong, the lower often sub-cordate and ovate-oblong, sometimes slightly hastately lobed, 1.5 to 2.5 in. long, .5 in. wide; petiole .25 to .5 in. long. Flowers cymose, few or many on slender peduncles 1 to 3 in. long; bracts minute, persistent. Sepals elliptic-obtuse, .25 in. long, margins when dry often inflexed above.

Corolla sub-campanulate, '75 in. long, white with a pinkish tinge or yellowish-white or yellow. Ovary 2-celled, each cell 2-ovuled. Capsule ovoid, '25 in. long, papery, 1-celled, with only a trace of the original dissepiment near the base. Seeds glabrous. Bull. Herb. Boiss. V. 382. Convolvulus caspitosus, Roxb. Hort. Beng. 14, Flor. Ind. I. 483, and ed. Carey & Wall. II. 70; Wall. Cat. 1357. C. Benthamii, Wall. Cat. 1393. Hewittia caspitosa, Steud. Nomencl. Bot. ed. II. i. 757. Skinneria caspitosa, Choisy Convolv. Or. 105, t. 6, and in DC. Prod. IV. 435. Ipomaa linifolia, Bl. Bijdr. 721; Choisy DC. Prod. IX. 369; Benth. Fl. Austr. IV. 423; Clarke in Hook. f. Flor. Brit. Ind. IV. 205. I. setulosa, Zoll. & Mor. Syst. Verzeichn. 51.

PERAK: Larut, King's Collector 2486! MALACCA: Griffith! SINGAPORE: Kurz 2976! Hullett 127! 387! King! King's Collector 1193!—Distrib. E. Himalaya, Indo-China, Malay Archipelago, Australia.

5. MERREMIA CONVOLVULACEA, Dennst. Schl. Hort. Malab. 39. A much-twining glabrous or casually hirsute often muricated herb. Leaves ovate-cordate, acute, glabrous, margin usually crenate or toothed, sometimes 3-lobed, 1 to 2 in. long, 5 to 1 in. wide; petiole ·5 to 2 in. long. Flowers numerous, rather densely cymose, on axillary peduncles 5 to 3 in. long; bracts small, caducous. Sepals elliptic, glabrous, 2 in. long, ultimately sub-patent, margins often at length sub-involute. Corolla funnel-shaped, externally glabrous, vellow, 5 to ·6 in. long. Capsule ovoid, sub-angular, at the apex rather thicker than elsewhere and often depressed, 25 in. long; cells 2. Seeds puberulous. M. hederacea, Hallier f. Engl. Bot. Jahrb. XVIII. 168, and Verslag. Buitenzorg 1895, 126. Evolvulus hederaceus, Burm. Fl. Ind. 77, t. 30, f. 2. Convolvulus flavus, Willd. Sp. Pl. 852. C. strictus, Vahl Symb. III. 28. C. dentatus, Vahl Symb. III. 25; Roxb. Flor. Ind. ed. Carey & Wall. II. 62; Wall. Cat. 1349. Ipomæa striata, Poir. in. Lamk Encyc. Meth. Suppl. IV. 632 (not of Roth). I. dentata, Willd. ex Roem. & Schult. Syst. IV. 789. I. subtriflora, Zoll. & Mor. Verzeichn. 51.

Perak: Durian, King's Collector 397! Larut, Scortechini 1832! Pahang: Khol, Ridley 2168! Johore: Serom, Ridley! Singapore: Dorward!—Distrib. S.E. Asia, Africa, Australia.

6. Merremia nymphæifolia, Hallier f. Verslag. Buitenzorg, 1895, 127. A large woody climber. Leaves orbicular-ovate, shortly acuminate, entire, glabrous on both surfaces, peltate with a rounded or slightly retuse base, 6 to 10 in. long, 5 to 8 in. wide, the floral leaves more deeply cut and at times cordate with a narrow sinus. Flowers large, in loose 4-15-flowered cymes on a common peduncle sometimes shorter

than the petioles, sometimes longer than the leaves. Sepals broad, obtuse, coriaceous, nearly equal, in flower '75 in., in fruit nearly 1 in. long. Corolla wide-campanulate, 2 to 2.5 in. long, glabrous externally, yellow or white or purplish. Stamens 5; anthers hirsute. Capsule sub-globose, 1 in. in diam. Seeds pilose. Ipomæa nymphæifolia, Bl. Bijdr. 719; Prain Journ. As. Soc. Beng. LXIII. 2, 107. I. Rumphii, Miq. Flor. Ind. Bat. II. 605. I. peltata, Choisy, Convolv. Or. 70, and in DC. Prod. IX. 359; Miq. Flor. Ind. Bat. II. 605; Benth. Flor. Austral. IV. 408; Bak. Flor. Maurit. 208. Convolvulus peltatus, Linn. Sp. Pl. 1194. Spiranthera peltata, Boj. Hort. Maurit. 226. Operculina peltata, Hallier f. Engl. Bot. Jahrb. XVI. 549; XVIII. 119. Chironia lanosanthera, Nav. & Fernand. Vill. in. Blanco Flor. Fil. ed. III. Ic. II. t. 261, f. 1.

Perak: Pangkor, Scortechini 1074! Ridley 7158!—Distrib. Mascarenes, S.E. Asia, Australia, Polynesia.

7. MERREMIA UMBELLATA, Hallier f. Eng. Bot. Jahrb. XVI. 552; VAR. orientalis, Verslag. Buitenzorg, 1895, 132, and Bull. Herb. Boiss. V. 381. A climbing softly hairy or almost glabrous shrub, stems often 15 to 20 feet long. Leaves cordate or hastate, elliptic or oblong, obtuse or shortly acute, entire or very rarely sinuate or angled, nerves rather distinct, softly hairy on both surfaces, or only beneath and glabrous except the nerves above, rarely quite glabrous above and only hairy on the nerves beneath; length 1.5 to 4 in., width 1 to 3 in.; petioles often softly hairy, 2 to 6 in. long. Flowers in compact corymbose cymes on axillary usually softly hairy peduncles 5 to 1 in. long; pedicels 2 to 1 in. long; bracts caducous. Sepals elliptic, obtuse, entire or mucronate, hairy or glabrous, 25 to 3 in. long. Corolla tubularcampanulate, white, or white with a yellow tinge, 1 to 1.5 in. long, lobes short, at first hirsute externally. Capsule globose, glabrous, 3 in. wide. Seeds patently hirsute with blackish hairs. Convolvulus blandus, Roxb. Hort. Beng. 13; Flor. Ind. I. 470, and ed. Carey & Wall. II. 50, 70; Wall. Cat. 1342. C. cymosus, Lamk Encycl. Meth. III. 556. C. pentagonus, Roxb. Hort. Beng. 14, Flor. Ind. I. 485, and ed. Carey & Wall. II. 72; Wall. Cat. 1343. C. Rothii, Spreng. Syst. I. 600. Ipomæa cymosa, Roem. & Schult. Syst. IV. 241; Blume Cat. Gewachs. Buitenz. 50; Choisy Convolv. Or. 79, and in DC. Prod. IX. 371; Bot. Reg. 1843, t. 24; Clarke in Hook. f. Flor. Brit. Ind. VI. 211. I. bifida, Roth Nov. Sp. 118. I. Heynei, Roem. & Schult. Syst. IV. 237. I. Rothii, Roem. & Schult. Syst. IV. 241. I. Olanda, Sweet Hort. Brit. ed. II. 372. I. caliginosa, Choisy Convolv. Or. 79, and in DC. Prod. IX. 370.

Perak: Thaipeng, Scortechini! Krian, Scortechini! Larut, King's Collector! Penang: Wallich! King! Deschamps! Selangor:

Ridley! Andamans: very common. Nicobars: Kurz! Prain!—Distrib. E. and S.E. Asia, Tropical Africa.

Var. occidentalis, Hallier f. Verslag. Buitenzorg 1895, 127. Leaves wide-cordate, softly hairy on both sides, 4 in. long, 3.5 in. wide; cymes umbellate; corolla yellow. Convolvulus umbellatus, Wall. Cat. 2329. Ipomæa umbellata, Mez Prim. Flor. Esseq. 99. I. cymosa, var. culta, Prain Journ. As. Soc. Beng. LXIII. 2, 108.

Perak: Sungah Ryah, Kunstler 912!—Distrib. Bengal, naturalised; Tropical America.

8. Merremia crispatula, Prain Beng. Pl. II. 730; var. andamanica, Prain. A large glabrous scandent herb. Leaves ovate-cordate, acuminate, margins entire or faintly undulate, glabrous on both surfaces, 3 to 4 in. long, 2.5 to 4 in. wide; petiole 1 to 1.5 in. long. Flowers in axillary few-flowered cymes, peduncles 1.5 to 2 in. long, pedicels .75 to 1.25 in. long, thickened upwards. Sepals orbicular, .5 in. long, in fruit .75 in. long. Corolla campanulate, limb hardly lobed, tube hirsute externally, yellow, 1.25 in. long. Capsule suborbicular, .75 in. across. Seeds minutely velvety, margins somewhat shaggy. Ipomæa petaloidea, var. andamanica, Prain Journ. As. Soc. Beng. LXIII. 2, 110.

Andamans: S. Andaman, common.

This is in all probability specifically distinct from Merremia crispatula (Ipomæa petaloidea, Choisy), but it seems preferable to treat it for the moment as a variety of that species and not as a new species, because of its remarkable resemblance to Merremia Riedeliana, Hallier f. (Ipomæa Riedeliana, Oliv.), and Merremia mammosa, Hallier f. (Ipomæa mammosa, Choisy). From the former, as described and figured by Oliver, this differs in having a 4-celled ovary with 1 ovule in each cell, whereas M. Riedeliana has a 2-celled ovary with 4, sometimes 5, ovules in each cell. From M. mammosa, as figured by Rumphius, this differs in having obtuse calyx-lobes and a shaggy corolla; Rumphius' figure shows the sepals acute and the corolla glabrous. This plant appears to be the same thing as Convolvulus platypeltis, Span., from Timor, and if it proves to be distinct alike from M. Riedeliana and M. mammosa, which last is cited by Dr. Hallier as an Andaman plant, though we have no authentic example of M. mammosa from the Andamans at Calcutta, the name it should bear will be Merremia platypeltis.

12. OPERCULINA, Manso.

Large herbaceous climbers; stems, peduncles and petioles usually winged. Leaves large, entire or lobed, rarely peltate. Flowers large, showy, axillary, solitary or often in few-flowered cymes. Sepals 5, large, ovoid, glabrous, accrescent in fruit and ultimately irregularly splitting from the tip. Corolla infundibuliform, rarely campanulate; tube with 5 vertical smooth bands. Stamens 5; filaments filiform; anthers large, at length contorted; pollen never spinulose. Ovary 2-celled, glabrous; ovules 4; style filiform; stigma 2-globose. Fruit a capsule, not

opening by valves; the epicarp circumscissile above the middle, the cap in separating carrying away the style; the endocarp at first entire, at length rupturing irregularly. Seeds usually solitary, rarely more than one, black, smooth or furred, usually large.—Distrib. Species 15, tropics generally.

Stems winged; bracts large, coloured; flowers white or pale yellow; leaves softly pubescent, not palmate 1. O. Turpethum. Stems not winged; bracts small: flowers brilliant yellow; leaves glabrous, deeply palmately lobed 2. O. tuberosa.

1. OPERCULINA TURPETHUM, Manso En. Pl. Bras. 16, n. 49. A stout softly pubescent climber, with strong twining 4-angled or compressed less often sub-cylindric winged stems, wings membranous. Leaves large, ovate or oblong, obtuse or acute, 2 to 5 in, long, 1 to 3 in. wide, base cordate or truncate; petiole 1 in, long. Flowers axillary, in few-flowered cymes: peduncles 1 to 4 in, long: bracts oblong, 1 in, long. sometimes pinkish-purple, caducous. Sepals 5, ovate, softly pubescent, ·5 in, long: in fruit accrescent orbicular, concave, scarious and fissile. 1 in. long. Corolla white or pale vellow, tubular-campanulate, 1.5 in. long. Stamens 5, included, anthers at length contorted. Capsule globose, ·5 to ·75 in. across. Seeds 4 or fewer, glabrous. Hallier f. Engl. Bot. Jahrb. XVIII. 120, and Verslag. Buitenzorg, 1895, 128. Convolvulus Turpethum, Linn. Sp. Pl. 155; Roxb. Hort. Beng. 14, Flor. Ind. ed. Carey & Wall. II. 57, and Flor. Ind. I. 476; Wall. Cat. 1371; Bot. Mag. t. 2093; Hassk. Pl. Jav. Rar. 518. C. anceps, Linn. Mantiss. 43. C. triqueter, Vahl Symb. III. 30. Ipomæa Turpethum, R. Br. Prod. I. 485; Bot. Reg. t. 279; Chois. Convolv. Or. 68, and in DC. Prod. IX. 360; Kurz For. Flor. Burm. II. 218; Clarke in Hook, f. Flor. Brit. Ind. IV. 212. I. anceps, Roem. & Schult. Syst. IV. 231; Bl. Bijdr. 714; Choisy Convolv. Or. 68, and in DC. Prod. IX, 360. I. triquetra, Roem. & Schult. Syst. IV. 231. Spiranthera Turpethum, Boj. Hort. Maurit. 226. Argyreia alulata, Mig. Flor. Ind. Bat. II. 587.

Andamans: Narcondam, *Prain!* NICOBARS: Kamorta, *Kurz!* Malacca: *Griffith!*—Distrib. E. Africa, S.E. Asia, Australia, Polynesia.

2. OPERCULINA TUBEROSA, Meissn. in Mart. Fl. Bras. VII. 212. A stout glabrous climber with strong twining smooth or muricate stems. Leaves large, ovate, deeply palmately lobed; lobes elliptic-lanceolate, acuminate, entire, 3 to 5 in. across; petiole 2 to 5 in. long. Flowers axillary in many-flowered cymes; peduncles 2 to 6 in. long; bracts deciduous; pedicels 25 to 1 in. long. Sepals 5, elliptic-oblong, obtuse; accrescent in fruit and spreading, ultimately 2 in. long, 1 to 1.5 in. wide. Corolla yellow, tubular-campanulate, 2 in. long. Stamens 5, included,

anthers twisted. Capsule globose, 3 in. wide; peduncle somewhat thickened. Seeds furred along the angles. Hallier f., in Engl. Bot. Jahrb. XVI. 476, 549; XVIII. 119; Verslag. Buitenzorg 1895, 128, and Bull. Herb. Boiss. VII. 410. Ipomæa tuberosa, Linn. Sp. Pl. 160; Choisy in DC. Prod. IX. 362 (partly).

SINGAPORE: Hullett 645, in cultivation.—DISTRIB. America, Africa, India, Malaya, New Caledonia.

LEPISTEMON, Bl.

Stout climbing herbs, with villous stems. Leaves cordate, often more or less lobed. Flowers in very dense axillary cymes; bracts narrow, deciduous. Sepals 5, sub-equal, herbaceous, hispid or glabrous, acute or obtuse. Corolla small, yellowish-white; tube hirsute externally, narrowed and shortly cylindric at base, urceolate above; limb shortly 5-lobed. Stamens 5, included; filaments dilated at their bases into 5 sub-equal, concave scales arched over the ovary; disk large cupular. Ovary 2-celled; ovules 4; style very short; stigma 2-partite, sub-capitate. Fruit a 4-valved capsule. Seeds glabrous.—Distrib. Species 3, S.E. Asiatic and African.

LEPISTEMON FLAVESCENS, Bl. Bijdr. 722. A climber with stout fulvous-villous stems. Leaves ovate-cordate, acute, entire or often distinctly 3-lobed, densely tawny-tomentose on both surfaces; 3 to 5 in. wide; petiole 1 to 2 in. long. Flowers yellowish-white in closely 10-30-flowered axillary cymes, sessile or on short peduncles 25 to 5 in. long; bracts tawny-hirsute, 2 in. long, deciduous. Sepals 5, rather narrowly ovate to lanceolate, sub-acute to rather finely acuminate, densely patently sub-strigose, 35 to 4 in. long. Corolla narrow and hyaline at the base, membranous and from slightly to widely urceolate above: tube hirsute externally; limb widely infundibuliform. Stamens 5, the basal processes papillose or hirsute, included in the lower part of the corolla-tube and overarching the short style; filaments glabrous, included in the upper part of the corolla-tube. Ovary 2-celled; ovules 4; style very short; stigma 2-lobed, lobes sub-globose. Capsule ovoid, glabrous, 2-celled, 4-valved, 25 in. long, normally 4-seeded. Seeds glabrous. Mig. Flor. Ind. Bat. II. 629; Prain Journ. As. Soc. Beng. LXIII. 2, 111; Wight Ic. t. 1362; Choisy in DC. Prod. IX. 348. L. Wallichii, Choisy Convolv. Or. 61, and in DC. Prod. IX. 348; Clarke in Hook, f. Flor, Brit, Ind. IV. 216. Convolvulus cephalanthus, Wall. Cat. 1402. C. binectariferus, Wall. in Roxb. Flor. Ind. ed. Carey & Wall. II. 47. Vallaris controversa, Spreng. Syst. cur. post. 65. Ipomæa Wallichii, Steud. Nomencl. Bot. Nemodon sp., Griff. Notul. IV. 286.

PERAK: Larut, Scortechini n. 1544! Goping, King's Collector 987! 1059!—Distrib. Assam, Tenasserim, Chittagong, Java, Borneo, Philippines.

The three gatherings from Perak agree with each other in every respect. They differ from the plant as it occurs in Tenasserim, in having a more widely urceolate corolla and even longer and more lanceolate sepals; at the same time they differ from the plant as it occurs in the Malay Archipelago, in having the sepals narrowly lanceolate and acuminate, instead of ovate and sub-acute. As regards corolla, however, they are exactly like the species as it occurs elsewhere in Malaya. Since the Perak plant combines the characters of the two previously recognised species—

L. Wallichii with long acuminate sepals and L. flavescens with wide-urceolate corolla—
it appears to afford conclusive proof of the suggestion already made by Clarke, l.c., that the Assamese and the Malayan plants are no more than forms of one somewhat variable species. An Indian form occurs in Travancore; this has been characterised by Stapf as a distinct species, L. leiocalyx, probably quite justly, since the Travancore plant has quite glabrous and obtuse sepals: the same form occurs in Chittagong; otherwise, however, the Indian plant agrees with the forms reported from Indo-China and Malaya.

IPOMŒA, Linn.

Herbs, rarely shrubs, twining or prostrate, less often sub-erect or erect. Leaves alternate, entire lobed or divided. Flowers axillary, solitary or in cymes, the cymes rarely paniculate, or in terminal spikes; bracts various. Sepals 5, ovate or linear, equal or unequal. Corolla campanulate or infundibuliform; limb plicate, very slightly 5-lobed. Stamens 5, included or very rarely exserted; filaments filiform or dilated at the base, often somewhat unequal; anthers straight or contorted; pollen spinulose. Ovary 1-3-celled, rarely 4-celled; ovules 4, rarely 6; style filiform; stigma capitate, entire or 2-3-globose, rarely stigmas 2, linear. Fruit a 4-6-valved capsule, rarely indehiscent. Seeds 4, less often 6, rarely solitary, glabrous, bearded, or uniformly velvety or woolly.—Distrib. Species about 300, throughout the tropics.

Leaves softly pubescent or densely hirsute on both surfaces :-Leaves deeply 5-7-lobed; flowers densely capitate with a whorl of involucrant bracts .. 1. I. Pes-Tigridis. Leaves entire or slightly 3-lobed; flowers in congested cymes, with often one of the bracts foliaceous .. 2. I. Leari. Leaves glabrous or only slightly hirsute or pubescent:-Leaves all deeply 5- or more-lobed, glabrous:-Leaves digitately 5-lobed, lobes nearly if not quite distinct at the base; flowers more or less white .. 3. I. pulchella. Leaves palmately 5-7-lobed, lobes not as a rule more than three-fourths cut to the base; flowers purplish-.. 4. I. paniculata. Leaves entire or slightly obed or if (rarely) deeply lobed the lobes only 2:-Flowers in few-flowered axillary cymes :-Cymes corymbose and lax or flowers 2 or solitary:-

Terrestrial, firm-stemmed plants :-Flowers purple :-Leaves ovate-cordate, acute or acuminate, entire or more or less lobed :-Cultivated species with tuberous edible roots. often without flowers, rarely with seeds .. 5. I. Batatas. Wild plants or if grown in gardens with the roots not edible :-Large stout climbers on bushes near seacoasts; flowers large, 4 in. long; sepals obtuse 6. I. illustris. Slender climbers; flowers never more than 1.5 in. long; sepals acute or acuminate:-Climbing or trailing herbs on sea-beaches: flowers 1.5 in. long 7. I. denticulata. Climbing herbs in gardens, or garden escapes; flowers 5 in. long .. 8. I. triloba. Leaves oblong, obtuse or 2-lobed; littoral sandbinding creepers .. 9. I. Pes-Capræ. Flowers white or yellowish-white; leaves oblong or linear-oblong, emarginate, sometimes lobed, occasionally lyrate; littoral sand-binding creepers .. 10. I. littoralis. Aquatic or palustrine herbs; stems soft, thick and spongy, trailing and rooting on wet mud or floating in ponds and ditches; flowers purple 11. I. reptans. Cymes subumbellate, dense; flowers pale purple, or .. 12. I. sagittæfolia. white with a darker purple eye Flowers in many-flowered rather condensed axillary (13. I. staphylina, .. \ VAR. malayana. panicles; flowers white, slightly tinged with pink

1. IPOMŒA PES-TIGRIDIS, Linn. Sp. Pl. 162. A hirsute twining herb; stems patently hirsute. Leaves hirsute on both surfaces, deeply 5-9-lobed, lobes elliptic, acuminate, narrowed at the base; length 1 to 5 in., width 1 to 4 in.; petiole 1 to 2 in. long. Flowers densely capitate, on axillary hirsute peduncles 5 to 3 in. long; the heads surrounded by a whorl of fulvous-hirsute bracts, the outer ovate or elliptic-oblong with cuneate or rounded bases 1 in. long, the inner narrower acute 5 to 75 in. long. Sepals lanceolate, acute, tawnyhirsute, 3 to 5 in. long, scarcely altered in fruit. Corolla 1.25 in. long, sparsely strigose externally, infundibuliform with rather narrow tube and abruptly widened mouth, pink. Capsule ovoid, 25 in. long, glabrous, chartaceous. Seeds minutely velvety. Roxb. Flor. Ind. ed. Carey & Wall. II. 93; Bl. Bijdr. 709; Wight Ic. t. 836; Choisy Convolv. Or. 73, and in DC. Prod. IX. 363; Clarke in Hook. f. Flor. Brit. Ind. IV. 204; Hallier f. Bull. Herb. Boiss. V. 379. Convolvulus Pes-Tigridis, Spreng. Syst. I. 592; Wall. Cat. 1374. C. bryoniæfolius Salisb. Prod. 125. Convolvuloides palmata, Moench. Meth. 452. Rheede Hort, Malab. XI, t. 59.

Malacca: Griffith!—Distrib. Tropical Africa, S.E. Asia generally.

2. Ifomca Leari, Paxt. Bot. Mag. VI. 267. A large hirsute climber, with perennial root. Leaves widely or deeply cordate, acute, entire or slightly 3-lobed, softly sparingly hirsute above, more densely beneath; length 3 to 6 in., width 2 to 5 in.; petiole hirsute, 2 to 3 in. long. Flowers in congested 3-7-flowered cymes on axillary softly pubescent peduncles 3 to 7 in. long; bracts linear acuminate 3 to 4 in. long, with casually a foliaceous bract 1.5 in. long, 3 to 5 in. wide, with a cuneate, less often sub-cordate base, close to the flowers. Sepals lanceolate, acuminate, 75 in. long, pubescent. Corolla abruptly campanulate from a narrow cylindric base, tube 2.75 to 3 in. long, purple-blue or mixed red and blue, changing with age. Fruit not seen. I. congesta, Prain Journ. As. Soc. Beng. LXIII. 2, 104 (not of R. Br.). Pharbitis Learii, Hook. Bot. Mag. t. 3928; Choisy in DC. Prod. IX. 343.

SINGAPORE: Hullett!—DISTRIB. Cultivated throughout the tropics, native of America.

Mr. Hullett, whose plant was probably an escape, notes on his specimen (Hullett 646): "January, 1885: blue convolvulus, wild? Have never seen it in seed."

3. IPOMGA PULCHELLA, Roth Nov. Sp. 115. A glabrous twining herb. Leaves glabrous, digitate, 5-lobed, lobes ovate-acute, base cuneate, central largest 1·25 to 1·5 in. long, ·5 to ·75 in. wide, basal smallest ·5 to ·75 in. long, ·3 to ·5 in. wide; petiole glabrous, ·75 to 2 in. long. Flowers in axillary 1-3-flowered cymes; peduncles ·25 to 1·25 in. long; bracts minute, deciduous; pedicels ·5 in. long, with small ovate subpersistent bracteoles below the middle. Sepals ovate, glabrous, ·2 to ·25 in. long, the inner obtuse, the outer sub-acute. Corolla campanulate, 2 in. long, white or with a tinge of rose. Capsule globose, glabrous, ·5 in. wide. Seeds villous. Wight Ic. 158; Choisy in DC. Prod. IX. 386. I. palmata Clarke in Hook. f. Flor. Brit. Ind. IV. 386 in part (not I. palmata, Forsk = I. cairica, Sweet).

MALACCA: Maingay. SINGAPORE: Tanglin, Ridley 5817!—DISTRIB. India, Indo-China.

Mr. Ridley's specimens may be from plants escaped from cultivation; they are noted as "from behind the stable, Tanglin." This is one of two species often cultivated in India under the name of the "Railway Creeper"; the other species so termed is the American Merremia quinquefolia, Hallier f.; the latter we have not yet received from the Malay peninsula, though it has already escaped and become domesticated near Port Blair in the Andamans.

4. IPOMEA PANICULATA, R. Br. Prod. I. 486. A large scandent perennial climber with a tuberous root; stems glabrous. *Leaves* palmately 5-7-lobed, glabrous, the lobes sometimes cut almost to

the base, lanceolate or elliptic, often spathulate; length 3 to 7 in., width 2.5 to 6 in.; petiole 2 to 5 in. long. Flowers in many-flowered axillary cymes, on peduncles 2 to 6 in. long; pedicels 25 to 75 in. long; bracts deciduous. Sepals elliptic, shortly acute, glabrous. ·25 to ·3 in. long, enlarged and concave in fruit, ·4 to ·5 in. long. Corolla 1.5 to 2.25 in. long, glabrous externally, wide-campanulate. purplish-pink. Stamens 5, anthers straight. Ovary 4-celled for threefourths of its height or throughout. Capsule ovoid, 3 in. long, 4-celled throughout, 4-valved. Seeds woolly with long hairs which protrude from the chinks of the capsule. Bl. Bijdr. 709; Bot. Reg. t. 62; Hallier f. Bull. Herb. Boiss, V. 379. Convolvulus paniculatus, Linn. Sp. Pl. 223; Roxb. Flor. Ind. I. 478, and ed. Carey & Wall. II. 63; Wall. Cat. 1350; Spreng. Syst. I. 591. C. platensis, Spreng. Syst. I. 591. C. insignis, Spreng. Syst. I. 592. C. roseus, Kunth in Humb. & Bonpl. III. 108 (not of Miller). Ipomæa digitata, Linn. Syst. ed. X. 924; Meissn. in Mart. Fl. Brasil. VII. 278; Choisy in DC. Prod. IX. 389; Clarke in Hook. f. Flor. Brit. Ind. IV. 202. I. mauritiana, Jacq. Hort. Schoenbr. II. 39, t. 200. I. gossypifolia, Willd. Enum. Hort. Berol. 208. I. eriosperma, Beauv. Fl. Owar. & Benin II. 73, t. 105. I. insignis, Andr. Bot. Rep. t. 665; Bot. Reg. t. 75; Bot. Mag. t. 1790. I. tuberosa, G. F. W. Mey. Prim. Fl. Esseq. 102. I. platensis, Ker-Gawl. Bot. Reg. t. 333; Bot. Mag. t. 3685; Choisy in DC. Prod. IX. 387. Batatas paniculata, Choisy Convolv. Or. 54, t. 1, f. 2, and in DC. Prod. IX. 339; Wight Madr. Journ. Lit. IV. t. 11. B. edulis, var. γ, Choisy in DC. Prod. IX. 339.

PERAK: Scortechini! PENANG: Wallich 1350! Deschamps! SINGA-PORE: Chan-chu-kang, Ridley 3909!—DISTRIB. Cosmopolitan in the tropics.

5. IPOMŒA BATATAS, Lamk Encycl. Meth. VI. 14. A trailing or twining glabrous or sparingly hairy herb with tuberous roots; tubers red, white, or occasionally yellow. Leaves ovate-cordate, acute, entire or angular or somewhat lobed; 2 to 4 in. long, 2 to 3.5 in. wide; petiole 2 to 5 in. long. Flowers in few-flowered cymes, very often none produced, on axillary peduncles 1 to 4 in. long; pedicels ·25 to ·5 in. long; bracts small, lanceolate, deciduous. Sepals narrowly oblong, acute, the outer shorter, ·5 to ·6 in. long. Corolla 1 to 2 in. long, purplish, glabrous externally, campanulate. Stamens 5, filaments slightly hirsute at the base. Ovary 4-celled, glabrous, half-enveloped by the undulate disk. Capsule 4-celled, or casually 3-1-celled by suppression. Seeds glabrous. Bl. Bijdr. 712; Meissn. in Mart. Fl. Brasil. VII. 282; Clarke in Hook. f. Flor. Brit. Ind. IV. 202; Hallier f. Bull. Herb. Boiss. V. 380. I. Catesbæi, G. F. W. Mey. Prim. Fl.

Esseq. 103. Convolvulus Batatas, Linn. Sp. Pl. 154; Roxb. Flor. Ind. I. 483, and ed. Carey & Wall. II. 69; Wall. Cat. 1356. C. indicus, Moris. Hist. II. sect. I. t. 3, f. 4. C. edulis, Thunb. Fl. Japon. 84. C. esculentus, Salisb. Prod. 123. Batatas edulis, Choisy Convolv. Or. 53, and in DC. Prod. IX. 338. B. xanthorhiza Boj. Hort. Maurit. 225. Rumph. Herb. Amboin. V. t. 130. Rheede Hort. Malab. VII. t. 50.

PERAK: Larut; Scortechini 1836! but doubtless also present in other provinces, cultivated.

The Sweet Potato; very rarely seen in flower, still more rarely in fruit. A native of America, but now grown throughout the tropics.

6. IPOMŒA ILLUSTRIS, Prain Beng. Pl. II. 735. A glabrous climber. Leaves ovate or oblong, cordate or hastate, entire, glabrous, apex acuminate; nerves rather prominent; 4 to 6 in. long, 3·5 to 5 in. wide; petiole 1·5 to 2 in. long. Flowers in axillary cymes; peduncles 1 to 1·5 in. long, usually 2-3-flowered, often 1-flowered; bracts caducous; pedicels ·5 to 1·5 in. long. Sepals orbicular, obtuse, glabrous, ·3 to ·4 in. long. Corolla rather wide-campanulate, purple, 4 to 4·5 in. long, glabrous, limb 3 in. wide. Capsule ·5 in. wide, globose. Seeds with long silky hairs. I. campanulata var. illustris, Clarke in Hook. f. Flor. Brit. Ind. IV. 211.

Andamans: on the coasts, everywhere. Penang: Pulo Boetong, Curtis 1970!—Distrib. Coasts of Ceylon, Sunderbuns, Indo-China, and Malay Archipelago.

This is very nearly allied to *I. campanulata*, Linn., which appears, however, to be always an inland species, whereas this is always a littoral plant. *I. illustris* differs further in having flowers at least one-half larger, sepals quite glabrous, and fewer flowers to the cyme.

7. IPOMGEA DENTICULATA, Choisy in DC. Prod. IX. 379 (not of R. Br.). A glabrous trailing or twining littoral herb. Leaves ovate-cordate, acute, entire denticulate angled or sub-lobate, base rather deepcordate with an obtuse sinus, firm in texture but hardly fleshy; 1 to 2.5 in. long, .75 to 1.75 in. wide; petiole 1.5 in. long. Flowers axillary on short 1-3-flowered peduncles, never more than 1.5 in. long; pedicels (often only one) 1 to 1.25 in. long; bracts .2 in. long, linear. Sepals elliptic, abruptly acute, sub-scarious, .4 in. long. Corolla 1.5 in. long, tube funnel-shaped, abruptly widening at the mouth, purple. Ovary 2-celled. Capsule globose, .3 in. in diam., glabrous. Seeds smooth. Benth. Fl. Austr. IV. 421; Clarke in Hook. f. Flor. Brit. Ind. IV. 298; Hallier f. Engl. Bot. Jahrb. XVI. 554. I. littoralis, Bl. Bijdr. 713 Thw. Enum. 211 (not of Boiss.). I. subdentata, Miq. Fl. Ind. Bat. II. 614. I. cymosa, Bak. Fl. Maurit. 208 (not of Roem. & Schult.). I.

nicobarica, Kurz in Journ. As. Soc. XLV. 2, 141. Convolvulus denticulatus, Lamk Encycl. Meth. III. 540.

PERAK: Dindings, Scortechini 1066! Curtis 3449! PENANG: Bagian Jumal, Curtis 1974! PAHANG: Rumpin, Ridley! NICOBARS: common. Andamans: very common.—Distrib. Coasts of the Indian and Pacific Oceans, from the Seychelles to Polynesia.

This species, in the writer's experience, prefers shingle beaches, though occasionally it is to be met with on sandy beaches along with *I. biloba*.

8. IPOMEA TRILOBA, Linn. Sp. Pl. 229. A twining or prostrate herb with glabrous slightly angular stem. Leaves cordate, acuminate to an often rounded tip, entire or toothed or occasionally 3-lobed; 1.5 to 2 in. long, 1.25 to 1.75 in. wide; petiole slender, 1.75 to 2 in. long. Flowers in axillary 1-4-flowered cymes; peduncles 1 to 1.5 in. long; bracts lanceolate, .2 in. long, deciduous; pedicels .25 to .35 in. long. Sepals lanceolate, acuminate, ciliate with spreading yellowish hairs, .35 in. long. Corolla tubular, purple, .5 in. long. Capsule pilose. Choisy in DC. Prod. IX. 383.

SINGAPORE: Hullett !—DISTRIB. Cultivated in the tropics; native of America.

Under his n. 68, Mr. Hullett sent to Calcutta, in 1884, as *Ipomæa coccinea*, a mixture of two species, one of which is *Quamoclit phænicea*, the other being *Ipomæa triloba*; as they are not noted as cultivated it seems possible that *I. triloba* may at least casually occur as an escape at Singapore. For the detection of this mixture, which had not been observed by the writer when arranging the Calcutta *Convolvulaceæ* in 1894 (see Journ. As. Soc. Beng. LXIII. 2, 83 et seq.), we are indebted to Dr. H. Hallier.

9. IPOMŒA PES-CAPRE, Roth Nov. Sp. 109. A glabrous extensive sand-binding creeper. Leaves orbicular or oblong, obtuse emarginate or 2-lobed; 1 to 4 in. long and sometimes wider than long; thick, fleshy, when dry distinctly nerved; petiole 1 to 4 in. long. Flowers in axillary 1-3-flowered cymes; peduncles 1 to 4 in. long; bracts 2 in. long, lanceolate, deciduous; pedicels 75 to 1.5 in. long. Sepals ovate, obtuse, glabrous, 5 to 6 in. long, slightly enlarged in fruit. Corolla tubular-campanulate, glabrous, 2 in. long, purple. Capsule ovoid, glabrous, 5 in. long. Seeds villous. Choisy Convolv. Or. 63, and in DC. Prod. IX. 349; Meissn. in Mart. Fl. Brasil. VII. 256; Hallier f. Bull. Herb. Boiss. V. 381. I. biloba, Forsk. Flor. Ægypt.-Arab. 44; Clarke in Hook. f. Flor. Brit. Ind. IV. 212. I. maritima, R. Br. Prod. 486; Bl. Bijdr. 720; Bot. Reg. t. 319. Convolvulus Pes-Capræ, Linn. Sp. Pl. 159; Roxb. Hort. Beng. 14, Flor. Ind. I. 486, and ed. Carey & Wall. II. 74; Wall. Cat. 1360. C. maritimus, Lamk Encyc. Meth.

III. 550. C. bilobatus, Roxb. Hort. Beng. 14, Flor. Ind. I. 485, and ed. Carey & Wall. II. 73; Wall. Cat. 1359. Batatas maritima, Boj. Hort. Maurit. 225. Rumph. Herb. Amboin. V. t. 159, f. 1. Rheede Hort. Malab. XI. t. 57.

Penang: on the coast, Deschamps !—DISTRIB. Sea-shores of all tropical countries.

10. IPOMŒA LITTORALIS, Boiss. Fl. Orient. IV. 112. A glabrous or slightly puberulous sand-binding creeper. Leaves oblong, emarginate or lobed, often deeply so, and sometimes linear-oblong or linear or sub-lyrate, nerves very obscure; length 1.25 to 1.5 in., width .25 to ·75 in.; petiole 1 in. long. Flowers in axillary 1-3-flowered cymes; peduncles 1 in. long; bracts 2 in. long, linear-lanceolate, sub-persistent; pedicels in fruit slightly clavate, .75 to 1 in. long. Sepals ovate-obtuse or ovate-lanceolate, 6 in. long, obtuse with or without a terminal mucro. Corolla white or yellowish-white, 1.75 to 2 in. long, campanulate. Capsule ovoid, glabrous, 4 in. long. Seeds villous. Hallier f. Engl. Bot. Jahrb. XVI. 555. I. carnosa, R. Br. Prod. 485; Benth, Fl. Austral, IV. 419; Clarke in Hook, f. Flor. Brit. Ind. IV. 213. I. acetosæfolia, Roem. & Sch. Syst. IV. 246; Meissn. in Mart. Fl. Brasil. VII. 255, t. 94. I. longifolia, Benth. Pl. Hartweg. 16; Bot. Reg. 1840, t. 21. Convolvulus littoralis, Linn. Sp. Pl. 227. C. acetosæfolius, Vahl Eclog. I. 18. C. arenarius, Vahl Symb. I. 18. C. carnosus, Spreng. Syst. I. 609. C. stoloniferus, Cyril. Pl. Rar. I. t. 5. Batatas littoralis, Choisy Convolv. Or. 124, and in DC. Prod. IX. 337. B. acetosæfolia, Choisy in DC. Prod. IX. 338.

MALACCA: Griffith. PAHANG: Rumpin, Ridley!—DISTRIB. Seashores of all tropical countries.

11. IPOMŒA REPTANS, Poir. Encyc. Meth. Suppl. III. 460. An annual glabrous aquatic, stems prostrate on mud or floating on the surface of ditches and pools, hollow and spongy, rooting at the nodes below. Leaves elliptic-oblong, or cordate or hastate or oblong or lanceolate, entire or angular or sub-lobate; 3 to 6 in. long, 1 to 2·5 in. wide; petiole 1 to 6 in. long. Flowers in axillary 1-5-flowered cymes; peduncles 2 to 7 in. long; bracts inconspicuous; pedicels 1 to 2 in. long. Sepals ovate, obtuse, glabrous or faintly puberulous, 4 in. long. Corolla 2 in. long, purple, infundibuliform-campanulate. Capsule ovoid, glabrous, 3 in. long, 2-4-seeded. Seeds glabrous or very minutely closely silky. Bl. Bijdr. 714; Choisy Convolv. Or. 62, and in DC. Prod. IX. 349; Hallier f. Bull. Herb. Boiss. V. 380. I. aquatica, Forsk. Flor. Ægypt.-Arab. 44; Clarke in Hook. f. Flor. Brit. Ind. IV. 210. I. repens, Roth Nov. Sp. 110; Bl. Bijdr. 713. I. subdentata, Miq. Flor. Ind. Bat. II. 614. Convolvulus reptans, Linn. Sp. Pl. 158; Roxb. Hort. Beng. 14. C. repens,

Vahl Symb. I. 17; Roxb. Fl. Ind. I. 432, and ed. Carey & Wall. II. 68; Wall. Cat. 1355 (not of Linn.). C. Adansonii, Lamk Encyc. Meth. III. 560. Rumph. Herb. Amboin. V. t. 155, f. 1. Rheede Hort. Malab. XI. t. 52.

Andamans: Port Blair, *Prain!* and probably in some of the other provinces.—DISTRIB. Tropics of the Eastern Hemisphere.

12. IPOMŒA SAGITTÆFOLIA, Burm. Flor. Ind. 50. A perennial glabrous or at times pubescent or hirsute twining herb. Leaves ovate-cordate, acute, glabrous or sometimes pubescent, entire or sinuate, rarely lobed, basal lobes usually rounded; length 1 to 2.5 in., width .75-2 in.; petiole 1 to 2 in. long. Flowers in axillary peduncled sub-umbellate cymes; peduncles 5 to 7 in. long; bracts small, lanceolate, caducous; pedicels 3 to 5 in. long, in fruit thickened and clavate. Sepals ovate, sub-obtuse, slightly puberulous, 2 in. long, when dry slightly muriculate externally. Corolla pale purple or white with a purple eye, 1.5 to 2 in. long; tube cylindric, limb abruptly explanate. Capsule 25 to 3 in. long, ovoid, 2-4-seeded. Seeds furred. I. sepiaria, Koen. ex Roxb. Hort. Beng. 14, Flor. Ind. I. 500, and ed. Carey & Wall. II. 90; Choisy Convolv. Or. 82, and in DC. Prod. IX. 370, Wight Ic. t. 838; Clarke in Hook, f. Flor. Brit. Ind. IV. 209. I. striata, Roth Nov. Sp. 111. I. Heynei, Wall. Cat. 1387. Convolvulus maximus, Vahl Symb. III. 26. C. strictus, Vahl Symb III. 27. C. marginatus, Lamk Encyc. Meth. III. 558. C. sepiarius, Wall. Cat. 1384. C. incrassatus, Wall. Cat. 1386. Rheede Hort. Malab. XI. t. 53.

KEDAH: at 100 feet elevation, King's Collector 1705! MALACCA: Merliman Road, Derry 353! SINGAPORE: Ridley 6660! 11261!—DISTRIB. S.E. Asia generally.

13. IPOMŒA STAPHYLINA, Roem. & Schult. Syst. IV. 249; var. malayana, Prain Journ. As. Soc. Beng. LXIII. 2. 106. A glabrous scandent shrub over 90 feet long. Leaves glabrous, rather thick, dull green on both surfaces, sub-acute rather prominently veined; 2.5 to 4 in. long; petiole 1 to 2 in. long. Flowers numerous in rather dense panicles, 2.5 in. long, 2 in. wide; peduncles 5 to 1.5 in. long; bracts small, caducous; pedicels 1 to 25 in. long, mostly short. Sepals ovate, obtuse, glabrous, 2 in. long. Corolla white, slightly tinged with pink; tube narrowly funnel-shaped throughout, 1 to 1.25 in. long, hardly 3 in. wide at the throat, limb rather narrow, abruptly explanate. Capsule ovoid, sub-acute, 3 in. long, 4-seeded. Seeds with long silky hairs. Convolvulus polyanthus, Wall. Cat. 1378. Lettsomia sumatrana, Miq. Flor. Ind. Bat. Suppl. 560.

Penang: Porter (Wallich 1378)! Perak: Larut, Scortechini! King's Collector 1119! 2538! 5091!—Distrib. Sumatra.

This is very like typical *I. staphylina*, a species widespread in India, but differs considerably in the shape and size of the corolla, that of true *I. staphylina* being widecampanulate from a very short, narrow-cylindric base, usually '5 to '75, very rarely 1 in. long, and '5 to '75 sometimes 1 in. wide at the limb.

15. QUAMOCLIT, Moench.

Annual twining glabrous herbs. Leaves cordate and angled or lobed, occasionally divided. Flowers axillary, in few-flowered cymes; bracts small. Sepals 5, sub-equal or the outer rather the smaller; their apices often sub-aristate. Corolla pink or red, hypocrateriform, slightly irregular; tube slender or slightly infundibuliform; limb very slightly 5-lobed, spreading. Stamens 5, resupinate, much exserted; filaments unequal. Ovary glabrous 4-celled; ovules 4; style rather longer than the stamens; stigma 2-globose. Fruit a 4-celled 1-valved capsule, the septa thin, persistent. Seeds 4, black, dull, puberulous or glabrous.—Distrib. Species 7, mainly American, 2 now widely spread in the tropics of the Eastern Hemisphere.

1. Quamoclit phenicea, Chois. Convolv. Or. 51, t. 1, f. 1. A weak climbing or sub-scandent herb. Leaves ovate-cordate acute, glabrous, entire or lobed; 2 to 3 in. long, 2 to 2.5 in. wide; petiole 2 to 4 in. long. Flowers in axillary lax few-flowered cymes; peduncles slender, 2 to 6 in. long; pedicels erect; bracts minute. Sepals 5, elliptic, abruptly acuminate, 25 in. long, unchanged in fruit. Corolla dark-red, or variously in cultivated forms orange or yellow; tube slender, 1 in. long; limb salver-shaped, somewhat oblique, 75 in. across. Stamens 5, exserted. Capsule smooth, ovoid, 3 in. long, completely 4-celled with membranous persistent septa. Seeds pubescent. Choisy in DC. Prod. IX. 336; Hallier f. Bull. Herb. Boiss. V. 1042. Convolvulus phæniceus, Spreng. Syst. I. 596; Wall. Cat. 1372. Ipomæa phænicea, Roxb. Hort. Beng. 14, Flor. Ind. ed. Carey & Wall. II. 92, and Flor. Ind. I. 502. I. coccinea, Clarke in Hook. f. Flor. Brit. Ind. IV. 199.

SINGAPORE: Hullett!—DISTRIB. Widely naturalised throughout S.E. Asia, native of America.

This, as Dr. Hallier notes on a sheet in Herb. Calcutta, is much larger and more vigorous in all its parts than is *I. coccinea*, with which it is usually confounded in Eastern collections; it differs besides in having erect and not nodding pedicels. *I. coccinea* is not, so far as is known, semi-spontaneous anywhere in S.E. Asia; the present species is now very widespread there in a wild condition.

2. QUAMOCLIT PINNATA, Boj. Hort. Maurit. 224. A slender glabrous twining herb. Leaves ovate in outline, deeply pinnately divided into

numerous distant linear segments, glabrous; 3 to 5 in. long, 2 to 3 in. wide; petioles 1 to 3 in. long. Flowers in axillary lax few-flowered cymes; peduncles slender, 2 to 4 in. long; pedicels erect, if more than one virgate; bracts minute. Sepals 5, elliptic, 25 in. long, hardly changed in fruit. Corolla dark red, occasionally in cultivated varieties white; tube slender, 1 in. long; limb salver-shaped, somewhat oblique, 75 in. across. Stamens 5, exserted. Capsule smooth, ovoid, 3 in. long, completely 4-celled with membranous persistent septa. Seeds puberulous. Hallier f. Engl. Bot. Jahrb. XVIII. 154. Q. vulgaris, Choisy Convolv. Or. 52, and in DC. Prod. IX. 336. Convolvulus pinnatus, Desr. in Lamk Eneye. Meth. III. 567. C. Quamoclit, Spreng. Syst. I. 591; Wall. Cat. 1375. Ipomæa Quamoclit, Linn. Sp. Pl. 159; Bot. Mag. t. 244; Bl. Bijdr. 708; Roxb. Hort. Beng. 14, Flor. Ind. ed. Carey & Wall. II. 93, and Flor. Ind. I. 502; Clarke in Hook f. Flor. Brit. Ind. IV. 199.

Penang: Batu Gaja jungles, Deschamps!—Distrib. Widely naturalised in S.E. Asia, native of America.

16. Calonyction, Choisy.

Large herbaceous climbers, stems usually muricate. Leaves large, cordate, entire or angled. Flowers solitary or in few-flowered axillary cymes; bracts caducous. Sepals 5, herbaceous, smooth, usually aristate, sub-equal or the outer smaller. Corolla large, salver-shaped, white or rose-purple; tube narrow-cylindric; limb plicate. Stamens 5, adnate to corolla-tube, considerably exserted. Ovary glabrous, 2-locular; ovules 4; style filiform; stigma 2-globose. Fruit a 4-valved capsule. Seeds 4, dull, glabrous.—Species 6 to 7, all tropical American, 2 now widespread and sub-spontaneous in the tropics of the Eastern Hemisphere.

Calonyction bona-nox, Boj. Hort. Maurit. 227. A large climber, stems smooth or muricate, glabrous. Leaves ovate-cordate, acute, glabrous, entire or casually lobed; 3 to 8 in. long, 2 to 4 in. wide; petiole 3 to 6 in. long. Flowers on axillary 1-5-flowered peduncles, 2 to 6 in. long; bracts caducous. Sepals 5, usually ovate, obtuse with a mucro, very slightly enlarged in fruit, glabrous; 5 in. long. Corolla 3 in. long; tube linear, 2 in. wide; limb salver-shaped, 3 to 5 in. wide, white. Stamens 5, slightly unequal, distinctly exserted. Capsule ovoid-oblong, narrowed upwards, 1 in. long; peduncle in fruit slightly thickened. Seeds glabrous. Hallier f. Bull. Herb. Boiss. V. 1028. C. noctilucum, Don in Sw. Hort. Brit. ed. III. 482. C. speciosum, Choisy Mem. Soc. Gen. VI. 441, t. 1, f. 4, and in DC. Prod. IX. 345; Hallier f. Engl. Bot. Jahrb. XVI. 556; XVIII. 153. C. Roxburghii, G. Don Gen. Syst. IV. 263. Convolvulus aculeatus, Linn, Sp. Pl. ed. I. 155. C. bona-nox

Spreng. Syst. I. 600. C. grandiflorus, Linn. f. Suppl. 136; Willd. Sp. Pl. I. 2. 859; Pers. Synops. I. 179; Wall. Cat. 1370. C. latiflorus, Desr. in Lamk Encyc. Meth. III. 561. Ipomaa bona-nox, Linn. Sp. Pl. ed. II. 228; Roem. & Schult. Syst. IV. 217; Bl. Bijdr. II. 712; Kurz For. Fl. Burm. II. 217; Clarke in Hook. f. Flor. Brit. Ind. IV. 197. I. grandiflora, Lamk Ill. I. 467, and Encyc. Meth. III. 16; Roem. & Schult. Syst. IV. 240; Roxb. Hort. Beng. 14, Flor. Ind. ed. Carey & Wall. II. 87, and Flor. Ind. I. 497. I. Roxburghii, Steud. Nomencl. ed. II. 1, 819. I. noctiflora, Griff. Not. IV. 286.

Penang: cultivated, Hallier. SINGAPORE: S. Mayer 211.—DISTRIB. Throughout the tropics; possibly not truly wild in our area.

17. ARGYREIA, Lour.

Climbing rarely sub-erect shrubs. Leaves cordate to lanceolate, pubescent or silky. Flowers axillary, usually in many-flowered cymes, often sub-capitate; bracts often conspicuous. Sepals 5, herbaceous in flower; in fruit leathery but little enlarged; often red within. Corolla funnel-shaped, rose-purple, tube more or less hirsute externally; limb plicate, shortly 5-lobed. Stamens 5, included; anthers oblong, straight. Disk annular. Ovary 4-celled; ovules 4; style filiform; stigma 2-globose. Fruit a hard dry berry. Seeds 4 or fewer, embedded in a mealy pulp.—Distrib. Species about 30, in the tropics of the Old World chiefly, and mostly in S.E. Asia and Polynesia.

ARGYREIA OBTUSIFOLIA, Lour. Flor. Cochin-Chin. 135. A large climber. Leaves elliptic or oblong, acute or obtuse, with or without a sub-mucronate tip, base cuneate or occasionally rounded, upper surface pilose, under surface silky strigose, nerves 9 to 11 pairs, often rather distinct beneath, very oblique even in wide-leaved plants; length 5 in., breadth 1.5 to 3 in.; petiole 6 to 8 in., very rarely 1 to 1.5 in. long. Flowers axillary; peduncles usually short, 6 to 1 in., but occasionally 1.5 to 3 in. long; cymes sub-capitate, the pedicels 1 to 2 in. long; bracts ovate, 15 to 2 in. long, caducous. Sepals 5, ovate-obtuse, 25 in. long, densely silky-strigose externally, sub-patent in fruit, pale red within. Corolla 1.5 in. long, tubular-campanulate, densely uniformly hirsute externally. Capsule 4 in. in diam., globose, pericarp chartaceous, pink. Seeds finely grey-velvety, hemispheric, 2 in. in diam. Choisy in DC. Prod. IX. 333. Convolvulus obtectus, Wall. Cat. 1416. Rivea? obtecta, Choisy, Convolv. Or. 28, and in DC. Prod. IX. 326. Argyreia Championi, Benth. Fl. Hongkong, 236. A. obtecta, Clarke in Hook f. Flor. Brit. Ind. IV. 186. Lettsomia Championi, Benth. & Hook. f. Gen. Pl. II. 869.

PERAK: Scortechini 1384! KEDAH: Langkawi, Curtis 2852!-

DISTRIB. Indo-China, from the Andamans and Tenasserim to Cochin China, Hongkong.

The two varieties distinguished in the Flora of British India can no longer be maintained in view of the large suites of specimens reported of late years from the Andamans, where the species is exceedingly common.

18. LETTSOMIA, Roxb.

Scandent, more or less hirsute or strigose shrubs. Leaves cordate rounded or truncate. Flowers in axillary, peduncled, corymbose or capitate cymes; bracts conspicuous. Sepals 5, orbicular or elliptic; somewhat thickened and coriaceous in fruit. Corolla usually pink; tube infundibuliform-campanulate; limb plicate, very shortly 5-lobed. Stamens 5, exserted or included; anthers oblong or linear, straight. Disk annular or cupular. Ovary 2-celled; ovules 4; style filiform; stigma 2-globose. Fruit a dry berry. Seeds 4 or fewer, embedded in a mealy pulp.—Distrib. Species about 40, in tropical Africa and S.E. Asia.

There is not, as the writer has already explained (Journ. As. Soc. Beng. LXIII. 2, 91), any very good reason for retaining Lettsomia as a genus apart from Argyreia. In Argyreia the ovary is completely 4-celled; in Lettsomia it is 2-celled, but not infrequently a partial dissepiment of smaller or larger size is to be found at the base of, sometimes half-way up, the cell.

Capsule chartaceous; seeds usually 4, only casually fewer; leaves cordate, softly hairy; cymes capitate; bracts large, elliptic-oblong, sub-persistent 1. L. pequensis. Capsule coriaceous or sometimes somewhat fleshy; seeds usually 1, only casually 2:-Cymes compact; bracts large, persistent:-Cymes capitate, globose; bracts purple, large, orbicularobtuse; leaves ovate-lanceolate, sparingly adpressed-hirsute 2. L. sphærocephala. Cymes sub-capitate, hardly globose; bracts ovate or ovatelanceolate, acute; leaves ovate or elliptic, base rounded or shortly cuneate :-Corolla 2.25 in. long; leaves chartaceous, glabrous and shining above, a few hairs on petiole and midrib beneath 3. L. Maingayi. Corolla 1.25 in. long; leaves firmer, glabrous not shining above, hirsute beneath :-Leaves hirsute, more especially on the nerves, beneath; .. 4. L. Ridleyi. petioles sparingly hairy Leaves densely hirsute beneath throughout; petioles (4a. L. Ridleyi, VAR. velutina. densely hairy Cymes lax; bracts small, rarely with a casual foliaceous bract in a cyme, and usually caducous:-Sepals narrowly lanceolate, acute, spreading or subreflexed in fruit; bracts lanceolate, occasionally one large and leaf-like; leaves elliptic, softly hairy on both 5. L. adpressa. surfaces

Sepals ovate or orbicular, obtuse or rarely some of them emarginate; bracts minute, usually caducous; leaves glabrous above:—

Sepals regular or nearly so, all entire :-

Corolla 1.5 to 1.75 in. long:—

Leaves densely tawny-tomentose beneath; sepals all softly tawny-velvety, the inner rather the smaller; corolla 75 in. long

Leaves sparingly strigose-hirsute beneath; sepals sub-equal, the outer pubescent, the inner at length almost glabrous

6. L. Curtisii.

7. L. penangiana.

8. L. Scortechinii.

9. L. rubicunda.

10. L. Kunstleri.

1. Lettsomia peguensis, Clarke in Hook. f. Flor. Brit. Ind. IV. 193. A large climber, sometimes 50 feet long, with villous stems and branches. Leaves ovate, ovate-lanceolate or sub-orbicular, apex acute, base cordate; both surfaces densely softly hairy, tomentum fulvous but not acicular; length 4 to 6 in., width 1.5 to 3.5, rarely 5 to 6 in.; petiole 1.5 to 4 in. long. Flowers in axillary capitate cymes; peduncles 5 to 9 in. long; bracts sub-persistent, densely softly hairy, elliptic-oblong, 1 in. long. Sepals 5, the outer elliptic acute, rather larger than the inner lanceolate, densely hispid; 5 to 7 in. long. Corolla infundibuliform-campanulate, softly sparsely hairy externally, 2 in. long; limb and upper two-thirds of tube bright pink, base of tube nearly or quite white. Berry when ripe glossy brown, sub-globose, thin-walled, 25 in. across. Seeds usually 2 or 4. Prain Journ. As. Soc. Beng. LXIII. 2, L. strigosa, Roxb. Hort. Beng. 13, ex Wall. Cat. sub. n. 1404. L. capitata, Miq. Flor. Ind. Bat. II. 591. Argyreia capitata, Choisy in DC. Prod. IX. 332, partly and excluding var. \(\beta\). conferta: Kurz For. Flor. Burm. II. 216 mainly. Convolvulus strigosus, Wall. Cat. 1365/2, 1365/c, and 1365/E partly. C. barbiger, Wall. Cat. 1404/1, 1404/2 in part. Argyreia barbigera, Choisy Convolv. Or. 42, and in DC. Prod. IX. 332.

Perak: Batu Kuran, Scortechini 1628! near Goping, King's Collector 1077! Larut, King's Collector 2622! near Ulu Kerling, King's Collector 8627! Penang: Bateh Pulo, Deschamps! Selangor: Woods at Gua Batu, Ridley 8210! 8227! 10194!—Distrib. Burma, Tenasserim, Sumatra, Java.

Probably only a geographical form of *Lettsomia strigosa*, Roxb., which is widespread in Indo-China and extends to S. China.

2. Lettsomia sphærocephala, Prain Journ. As. Soc. Beng. LXXIII. 2, 19. A shrubby climber; branches irregularly angled, with ridged bark brownish on young shoots, pale straw-coloured on older twigs, sparingly beset with adpressed acicular hairs. Leaves ovatelanceolate, apex acute, base rounded, purplish beneath, very sparingly beset on both surfaces with adpressed hairs; length 4 to 5 in., width 1.5 to 2 in.; petiole 1 to 1.25 in., sparsely pubescent above with adpressed hairs. Flowers in compact capitate globose cymes 1.5 to 2 in. across, on long slender peduncles 2 to 12 in. long, sparingly adpressed-pubescent, surrounded by large orbicular purple involucrant sessile bracts 1:5 in. across, sparsely hirsute externally, quite glabrous internally, the individual flowers enveloped in similar but smaller sub-orbicular to spathulate bracteoles 5 in. long, 25 to 5 in. wide; pedicels short adpressedsetose. Sepals glabrous externally except at their setose apices, the outer sub-acute, the inner wider obtuse 25 in. long. Corolla 75 to 1 in. long, infundibuliform-campanulate, pink, softly adpressed-hirsute externally. Berry not seen. Argyreia sphærocephala, Prain MSS.

PERAK: Krian, Abu Salama, Gunong Haran Ryah, Scortechini!

A very striking and remarkable species. The corollas do not appear to be fullsized. Scortechini, on the ticket of his Gunong Haran Ryah specimens, has written "fruit from Maxwell's Hill," but unfortunately the fruiting specimens alluded to are not at Calcutta.

3. Lettsomia Maingayi, Clarke in Hook. f. Flor. Brit. Ind. IV. 195. A large slender climber; branches slender or stoutish, with spreading setulose hairs. Leaves ovate or elliptic, base rounded or very shortly cuneate, apex acute or shortly caudate-acuminate, papery, glabrous and shining on both surfaces except for a few hairs on the midrib beneath; length 5 to 7 in., width 3 to 4 in.; lateral nerves 5 to 7; petioles 5 to 1 in. long, very sparsely setulose. Flowers in axillary few-flowered cymes 2 to 3 in. wide; peduncles 25 to 2 in. long, rather closely hirsute with tawny spreading hairs; bracts ovate-lanceolate, 1.5 in. long, 6 in. wide, rather strongly parallel-nerved, sparingly hirsute externally, glabrous and dark purple within; bracteoles similar but smaller, 3 in. long. Sepals linear-lanceolate, long-acuminate, 75 in.

long, beset with long setulose hairs. Corolla tubular-campanulate, purple with whitish folds, 2·25 in. long; hairy externally. Stamens with filaments glandular-hairy at the thickened base. Berry ellipsoid, succulent, ·75 in. long, ·5 in. wide. Seed solitary.

Malacca: Griffith, Maingay, Derry 318! Goodenough 1432! Perak: Scortechini 297!

A very distinct species. There is no fruiting specimen in Herb. Calcutta; the above description of the berry is taken from the Flora of British India.

4. Lettsomia Ridleyi, Prain Journ. As. Soc. Beng. LXIII. 2, 98. A large climber; branches sparingly hirsute. Leaves elliptic-acuminate, quite glabrous above, hirsute especially on the nerves beneath; 5.5 in. long, 3.5 in. wide; petiole 1 to 3 in. long, sparsely hirsute. Flowers in compact sub-capitate S-10-flowered cymes 1.5 in. across, surrounded by large ovate-acute sessile foliaceous persistent bracts hirsute below, quite glabrous above, '8 in. long, '25 in. wide; bracteoles similar but smaller, '3 in. long; peduncles 2 to 6 in. long, hirsute. Sepals sub-equal, ovate-lanceolate, externally pubescent, '3 in. long. Corolla pink, infundiouliform-campanulate, 1.25 in. long, tube hirsute externally. Berry ovoid, '5 in. long, '3 in. in diam., the sepals spreading from its base.

JOHORE: Kota Tinggi, Ridley 4214! Chin-chin, Lake & Kelsall! SINGAPORE: Bukit Mandai, Ridley!

VAR. velutina, Prain l.c. Leaves beneath densely hirsute, as are the petioles, pedicels, and bracts externally.

SINGAPORE: Bukit Mandai, Ridley!

Nearest to *L. sphærocephala*, but distinguished by the acute bracts and bracteoles, nd to *L. Maingayi*, from which it differs by the smaller flowers and shorter bracts and sepals. Van. *velutina* in foliage and tomentum remarkably resembles *L. rubicunda*, but the acute sepals and large persistent bracts and bracteoles amply distinguish it.

5. Lettsomia adpressa, Miq. Flor. Ind. Bat. II. 591. A scandent shrub; branches hirsute; stems 10 to 30 feet long. Leaves elliptic, softly hirsute on both surfaces; base rounded or cuneate, apex acute; length 4 to 5 in.; width 2 to 2.5 in.; petiole 1.5 in. long, softly hirsute. Flowers in axillary few-flowered, somewhat open cymes 2 in. across; peduncles .5 to 1.5 in. long, hirsute; bracts lanceolate, hirsute, .3 in. long, .15 in. wide, with an occasional longer leaf-like bract; bracteoles small. Sepals .3 to .5 in. long, narrowly lanceolate, sparingly hirsute, spreading or sub-reflexed in fruit. Corolla tubular-campanulate, dull claret, or pale pink and white, or white with claret stripes, externally hairy; tube 1.25 in. long. Berry ellipsoid, .5 in. long, .3 in. wide, at first green with a reddish tint, becoming bright pink, and at length, when quite ripe, reddish-brown. Clarke in Hook. f. Flor. Brit. Ind. IV. 196.

Convolvulus adpressus, Wall. Cat. 1424. Moorcroftia adpressa, Choisy Convolv. Or. 49, and in DC. Prod. IX. 334.

Penang: Porter! Kunstler 1324! 5271! Curtis 318! Malacca: Maingay! Perak: Scortechini 1280! King's Collector 2457! 5400! Wray 1914! 3298! 3961!

6. Lettsomia Curtish, Prain Journ. As. Soc. Beng. LXIII. 2, 100. A climber with brown glabrous branches. Leaves elliptic, shortly acuminate, glabrous except for a few hairs on the midrib above, sparingly adpressed-hirsute beneath; length 4 to 5 in., width 2.5 to 3 in.; petiole 2 to 3 in. long, glabrous. Flowers in axillary compound sub-umbellate cymes, 3 in. wide, 12–16-flowered; peduncles 4 to 10 in. long, brown, glabrous; bracts deciduous. Sepals coriaceous, 25 in. long, the three outer sparingly hirsute, rounded, entire, the two inner wider, deeply emarginate, glabrous. Corolla not seen. Berry ovoid, succulent, 75 in. long, 5 in. wide, lower third closely embraced by the sepals.

Selangor: Kwala Lampar, Curtis 2158!

A very distinct species, easily differentiated by its emarginate inner sepals.

7. LETTSOMIA PENANGIANA, Mig. Flor. Ind. Bat. III. 592. A climber with very slender stems sometimes 100 feet long, young branches thin, fulvous-tomentose, soon becoming glabrous. Leaves ellipticoblong, base rounded or cuneate, apex acute or sub-acute, papery, medium green glabrous above, very light green and glabrous or sparingly adpressed-pubescent and more closely hairy on the midrib beneath; 6 in. long, 2.5 in. wide; petiole 5 to 1 in., glabrous. Flowers in lax axillary cymes 2 to 3 in. across, the terminal flower usually longer than the others; peduncles slender, 2 to 6 in. long, very sparsely hirsute, soon glabrous; pedicels 3 to 7 in. long, slender, hirsute; bracts minute. Sepals ovate-obtuse, sparingly hairy and at length glabrescent, ·2 in. long, at length spreading or sub-reflexed. Corolla tubularcampanulate, externally hirsute, bright claret or purple within, paler without, 1.5 to 1.75 in. long. Berry ovoid, 6 in. long, 3 in. wide, rosepink, reddish-blue, or purple. Clarke in Hook. f. Flor. Brit. Ind. IV. 196; Prain Journ. As. Soc. Beng. LXIII. 2, 99. Convolvulus penangianus, Wall. Cat. 1425. Moorcroftia penangiana, Choisy Convolv. Or. 50, t. 4., and in DC. Prod. IX. 335.

Penang: Porter! Curtis 1586! Perang: very common; Scortechini 1147! Wray 2061! 2095! 2334! 2733! Curtis 2034! Derry! King's Collector 1936! 2048! 2574! 3223! 5339!

VAR. reticulata, Prain Journ. As. Soc. Beng. LXIII. 2, 100. Leaves thicker, secondary nerves beneath very distinct.

Perak: Larut, King's Collector 8544!

The leaves of this species are very characteristically glandular-punctate beneath. The peduncles and pedicels of var. reticulata are rather shorter than in the type and the corolla, described by Kunstler as "waxy white, pale blue inside," is only two-thirds the length and only half the width of that of L. penangiana proper. But the leaves have the same characteristic glandular punctulation and are similarly sparingly adpressed-pubescent beneath, while the fruit, described by Kunstler as a rich pink, is indistinguishable from that of L. penangiana. This form, therefore, though very distinct, cannot yet be more than varietally separated.

8. Lettsomia Scortechini, Prain Journ. As. Soc. Beng. LXIII. 2, 98. A strong climber; stems rusty-brown, very sparingly pubescent. Leaves ovate-acute, base rounded, firmly sub-coriaceous, very sparsely hirsute with scattered rusty hairs beneath, glabrous above; length 2 to 3 in., width 1 to 2 in.; petiole ·5 to 1 in., minutely sparingly rusty-pubescent. Flowers in open 3-8-flowered corymbose cymes 1 to 1·5 in. across; peduncles minutely sparingly rusty-pubescent, 2 to 5 in. long; bracts caducous. Sepals orbicular, minutely adpressed-grey-tomentose externally, in flower ·25 in., in fruit ·3 in. across, the inner larger than the outer. Corolla 1·5 in. long, infundibuliform-campanulate, pink, densely adpressed-fulvous-tomentose on tube and bands of limb externally. Berry sub-spherical to ellipsoid, ·5 in. wide, ·5 to ·75 in. long, the base closely embraced by the sepals.

PERAK: Canfield's Hill, 4,000 feet, Scortechini 381! Birch's Hill, Ridley 10681! Maxwell's Hill, Ridley 5559!

As in the case of *L. rubicunda*, one or two bracts remain on the specimens; they are small, orbicular, ·2 in across, but it does not follow that the fallen bracts were so small. The corollas on Scortechini's specimens, on which the original description was based, are about ·6 in. long, but subsequent material communicated by Mr. Ridley (*Ridley* 5559) shows that the flowers originally described were not fully expanded. Another of Mr. Ridley's specimens (10681) proves that the berry is not always subspherical. The species is obviously closely allied to *L. rubicunda*, but besides the very different degree of tomentum, *L. Scortechini* differs from *L. rubicunda* in having the inner sepals distinctly larger, instead of smaller, than the outer.

9. Lettsomia rubicunda, Clarke in Hook. f. Flor. Brit. Ind. IV. 195. An extensive climber; stems fulvous-tomentose. Leaves elliptic, shortly abruptly acuminate or acute, base rounded, sub-coriaceous, densely tawny-tomentose beneath, glabrous above; length 5 to 7 in., width 2 to 4 in.; petiole tawny-tomentose, 1 to 2 in. long. Flowers in open many-flowered corymbose cymes, 2 to 4 in. across; peduncles tawny-tomentose, 3·5 to 7 in. long; bracts caducous. Sepals orbicular, obtuse, softly tawny-velvety, in flower 2 in., in fruit 3 in. across, the inner rather smaller. Corolla ·75 in. long, infundibuliform-campanulate, pink, densely tawny-tomentose externally. Berry ellipsoid, obtuse,

smooth, dry, 75 in. long, 3 to 5 in. wide, the base closely embraced by the sepals. Convolvulus rubicundus, Wall. Cat. 1409. Argyreia rubicunda, Choisy Convolv. Or. 44, and in DC. Prod. IX. 333.

MALACCA: Griffith! Maingay.—DISTRIB. Burma.

The above description is taken from Griffith's Malacca plant; the writer has seen no other specimens. One or two bracts remain; they are small, '2 in. across, and orbicular, but it does not follow that the fallen bracts were so small. There is no perfect corolla on the specimens at Calcutta; the length of the tube given above is derived from Mr. C. B. Clarke's description.

10. Lettsomia Kunstleri, Prain Journ. As. Soc. Beng. LXIII. 2, 100. A slender climber, 50 to 80 feet long, young branches densely hirsute. Leaves elliptic-acuminate, glabrous and shining above, sparingly strigose-hirsute beneath, especially on the nerves, occasionally the midrib above sparsely hairy; length 3.5 to 4.5 in., width 2 to 2.5 in.; petioles densely hirsute, 1 to 1.5 in. long. Flowers in lax axillary 12–20-flowered cymes, 2 to 3 in. across; peduncles 5 to 8 in. long, densely hirsute; bracts hirsute, 3 in. wide; pedicels hirsute, slender, 5 to .75 in. long. Sepals orbicular, sub-equal, the three outer pubescent, the others at length almost glabrous, .15 in. long. Corolla white externally, bright pink or red within, externally hirsute, tubular-campanulate, .5 in. long. Berry ovoid, .5 in. long, .3 in. wide, deep glossy red.

PERAK: Larut; Kota, Wray 2856! Ulu Salama, Scortechini! Goping, Chanderiang, &c., King's Collector, 732! 2307! 2726! 5672! Campon Road, Ridley 9704! SELANGOR: Batu Caves, Ridley 8220!—DISTRIB. Sumatra.

Order LXXXII. SOLANACEÆ.

[By D. Prain.]

Herbs or shrubs, sometimes becoming small soft-wooded trees. Leaves alternate or at times in unequal pairs, rarely clustered, never truly opposite, entire, lobed or pinnate; stipules 0. Inflorescence of terminal or oftener lateral axillary or extra-axillary cymes, or of solitary or clustered pedicels, without bracts or bracteoles. Flowers regular, hermaphrodite. Calyx inferior, gamosepalous, lobes or teeth usually 5, rare 4 or 6 to 10; usually persistent, sometimes enlarged in fruit. Corolla gamosepalous 5-lobed or rarely (Datura) 10-lobed or with limb sub-entire; narrow-campanulate to rotate. Stamens 5, epipetalous; anthers oblong or narrow-ovate; cells parallel, dehiscing by apical pores or longitudinally. Ovary 2-celled or imperfectly

1-celled by abortion, or 4-celled by subsequent development of accessory dissepiments; style linear; stigma capitate or shortly lobed; ovules indefinite, on peltate intruded placentas. Fruit indehiscent, berry-like or capsular and opening by valvular or circumscissile dehiscence; usually 2-celled, rarely 4-celled, many-seeded. Seeds compressed, disc-like or sub-reniform with embryo peripheric; occasionally (Nicotiana) hardly compressed and with embryo straight.—DISTRIB. Species about 1,300, throughout tropical and sub-tropical countries.

Fruits berry-like, 2-celled, indehiscent; seeds compressed and embedded in pulp :-Anthers opening by 2 small pores at the tips; fruits globular (in S. Melongena sometimes elongated) 1. Solanum. Anthers dehiscing throughout longitudinally:-Calyx in fruit small, fruits usually elongated 2. Capsicum. Calyx in fruit enlarging and enveloping the globose berry 3. Physalis. Fruits capsular :-Capsules 4-celled and 4-valved, or sometimes hardly dehiseing; seeds compressed; flowers solitary 4. DATURA. Capsules 2-celled, dehiscing freely; seeds hardly compressed; flowers in panicles .. 5. NICOTIANA.

1. Solanum, Linn.

Armed or unarmed herbs, shrubs, or small trees. Leaves alternate or sub-opposed in unequal pairs, entire, lobed or pinnatifid. Cymes dichotomous or racemose, lateral or terminal. Calyx usually 5-lobed, rarely 10-lobed or sub-entire, sometimes enlarging in fruit. Corollatube short, rotate or very shortly campanulate; limb 5-lobed, plicate in bud. Stamens 5, with short filaments, adnate to throat of corolla; anthers oblong, narrowed upwards so that the two cells form a cone opening at the tip by terminal pores. Ovary 2-celled (in cultivated forms sometimes 3-4-celled); style columnar, stigma small. Fruit berry-like but with calyx at base, rarely overtopping it, globose or (rarely) elongated. Seeds very numerous, disk-like; embryo peripheric. —DISTRIB. Species 750, mostly tropical American, but spread throughout all tropical and sub-tropical regions.

Unarmed herbs or shrubs :-

Flowers in extra-axillary peduncled cymes or racemes :--Leaves glabrous or sparingly pubescent; cymes sub-umbellate; calyx-teeth obtuse, 5; corolla and ovary glabrous; berry red or black, rarely yellow 1. S. nigrum. Leaves densely stellately woolly; cymes corymbose; calyxteeth triangular, 5; corolla and ovary hairy; berry yellow Flowers axillary, pedicels fascicled or solitary; corolla glabrous :-

2. S. verbascifolium.

Calyx with a sub-entire margin; flowers white; leaves glabrous; epiphytic 3. S. parasiticum. • • • • • Calvx with a distinctly 10-toothed margin; terrestrial:-Leaves glabrous; calyx with 5 long teeth and 5 very short intermediate toothlets; corolla-lobes purplish; berry dark blue 4. S. Blumei. Leaves usually puberulous to pubescent, rarely almost glabrous; calyx with 10 long teeth; corolla white; berry 5. S. biflorum. Armed herbs with prickly stems and usually prickly leaves; corolla pubescent externally :-Densely stellate-tomentose throughout:-Calyx not overtopping the berry; erect herbs or shrubs:-Flowers white:-Leaves very prickly especially on the nerves beneath; ovary hirsute; fruit hispid with acicular hairs 6. S. ferox. Leaves with very few prickles; ovary and fruit glabrous 7. S. torvum. Flowers blue :-Racemes many-flowered; berry small, yellow, globose 8. S. indicum. Racemes few-flowered; berry large, purple, rarely white or yellow, often in cultivation ellipsoid or elongate .. 9. S. Melongena. Calyx overtopping the berry; a spreading shrub .. 10. S. sarmentosum. Thinly beset with minute hairs; berry large, smooth; calyx very prickly .. 11. S. aculeatissimum.

1. Solanum nigrum, Linn. Sp. Pl. 186. A herb or undershrub, 1 to 3 feet high; all parts sparingly pubescent or glabrous. Leaves petioled, membranous, ovate or oblong, narrowed towards apex and base, sinuate-toothed or -lobed; 3 to 4 in. long, 2 in. across; green on both surfaces; petioles 75 in. long. Flowers small, sub-umbellately clustered on stoutish extra-axillary peduncles 35 to 75 in. long; pedicels 5 to 8 together, slender, 35 in. long. Calyx sparsely puberulous, 5-toothed; teeth small, ovate-oblong, 05 in. long, in fruit hardly noticeable. Corolla white, rarely purplish, externally glabrous, 5 in. wide, rotate, 5-lobed. Ovary glabrous; style hairy at base. Fruit red or black, rarely yellow, globose, 25 in. across, supported by the saucer-shaped calyx. Seeds 05 in. in diam., almost smooth. Bl. Bijdr. 694; Dun. in DC. Prod. XIII. 150; Miq. Flor. Ind. Bat. II. 636; Kurz For. Flor. Burm, II. 224; Clarke in Hook, f. Fl. Br. Ind. IV. 229. S. rubrum, Roxb. Flor. Ind. I. 565. S. triangulare, Lamk Ill. II. 18. S. uliginosum, Bl. Bijdr. 695. S. Rumphii, Dun. in DC. Prod. XIII. 57. S. rhinocerotis, Bl. Bijdr. 695.

SINGAPORE: Ridley 8084! PERAK: Kota Bahru, King's Collector 566! Andamans: King's Collectors! NICOBARS: Kurz!—DISTRIB. Tropics generally.

2. Solanum verbascifolium, Linn. Sp. Pl. 184. An erect unarmed shrub, 8 to 20 feet high; all parts thickly stellate-tomentose, the

tomentum often scurfy. Leaves petioled, thickly herbaceous, ovatelanceolate to lanceolate, acute; base usually truncate or rounded, rarely cuneate; 4 to 7 in. long, 3 in. across; green above, white to yellowishbrown beneath from the scurfy tomentum; petioles 5 to 15 in. long. Flowers small, on thick tomentose pedicels, densely clustered in a small tomentose corymb-like cyme on an erect sub-terminal stout peduncle 1 to 3 in. long. Calyx densely tomentose, 5-toothed; teeth triangular, acute, 1 in. long in flower. 3 in. long in fruit; tube short. Corolla white, externally stellate-tomentose, 6 in. across, rotate, 5-lobed; lobes short, ovate-oblong. Ovary hairy; style glabrous. Fruit yellow, globose, ·4 in. wide, the lower portion embraced by the calyx-lobes. Seeds ·12 in. in diam., minutely dotted. Dun. in DC. Prod. XIII. 114; Lour. Flor. Cochin-Chin. 128; Wall. Cat. 2616; Kurz For. Flor. II. 225; Clarke in Hook, f. Flor. Brit. Ind. IV. 230; Mig. Flor. Ind. Bat. II. 640. S. pubescens, Bl. Bijdr. 698; Roxb. Flor. Ind. ed. Carey & Wall. II. 244 (not of Willd.).

Selangor: Kwala Lampar, Goodenough! Perak: King's Collector 2069! 7177! Wray 2357! Penang: Deschamps! Kedah: King's Collector 1704! Nicobars: Kamorta, Jelinek! Teressa, King's Collectors!—Distrib. Tropics of both hemispheres.

3. Solanum parasiticum, Bl. Bijdr. 697. An erect almost glabrous epiphytic shrub, 2 to 4 feet high. Leaves short-petioled, rather firmly membranous, lanceolate-acuminate, narrowed towards apex and base, entire; 6 to 8 in. long, 1·5 to 2 in. wide; green on both surfaces, minutely setulose above when young, glabrous beneath; petiole ·25 to ·35 in. long. Flowers small, clustered in an axillary fascicle of 2 to 7 together or sometimes solitary, on slender somewhat rigid glabrous pedicels ·6 to ·8 in. long. Calyx glabrous, small, the margin in flower sinuate representing either 5 or 10 teeth at most only ·1 in. long; in fruit slightly enlarged, saucer-shaped, the margin quite entire. Corolla white, glabrous externally, 5-lobed, rotate; ·25 in. across. Ovary and style glabrous. Fruit yellow, globose, ·25 in. in diam., resting on the saucer-shaped calyx. Seeds ·06 in. in diam., smooth. Nees Trans. Linn. Soc. XVII. 45; Miq. Flor. Ind. Bat. II. 641.

Perak: Larut, on trees, rather plentiful, Wray! Scortechini! King's Collector!—Distrib. Sumatra, Java.

Near S. subtruncatum but always epiphytic, and with an even more markedly truncate calyx-limb than in that species.

4. Solanum Blumei Nees ex Bl. in Bijdr. 696. An erect quite glabrous shrub, 3 to 4 feet high, with spreading branches. *Leaves* towards top in pairs from one node, usually one smaller, elliptic-acuminate at both ends, bases unequal; 4 to 6 in. long, 2 to 3 in. wide;

rather firmly membranous; lateral nerves 6 to 7 pairs; petiole ·3 in. long. Flowers in clusters of 2 to 9, rarely solitary, axillary; pedicels slender, in flower deflexed, in fruit spreading, ·75 in. long, thickened upwards. Calyx glabrous, limb sub-truncate with 5 subulate, and 5 intervening minute teeth, the longer series ·2 to ·25 in. long. Corolla with white tube and 5 purplish narrow-ovate lobes, ·3 in. across. Ovary and style glabrous. Fruit globose, dark blue, ·25 in. in diam., resting on the saucer-shaped calyx with persisting teeth. Seeds ·09 in. in diam., almost smooth. Nees Trans. Linn. Soc. XVII. 45; Dun. in DC. Prod. XIII. 180; Miq. Flor. Ind. Bat. II. 642.

Selangor: Ridley! Perak: Larut, King's Collector! Wray! Curtis! Ridley! Scortechini! Gunong Panti, Kunstler!—Distrib. Sumatra, Java, Borneo.

The commonest Solanum of its group in our area. It has been suggested by Clarke that there is little to separate this form specifically from S. subtruncatum; this is true, but there seems equally little to separate it specifically from S. biflorum. Its glabrous condition, however, at once distinguishes it from both as, if not a species, at least a very marked form.

5. Solanum Biflorum, Lour. Flor. Cochin-Chin. 129. An erect more or less pubescent shrub, 3 to 6 feet high; the young shoots often flocculose. Leaves membranous, elliptic or oblong, acuminate, base narrow-cuneate, entire; 3 to 5 in. long, 1.5 to 1.75 in. wide; green on both sides, setulose-pubescent, rarely glabrescent with age; petiole 7 in. long. Flowers small, clustered in axillary fascicles of 2 to 6 together, or solitary; pedicels slender, 65 in. long. Calyx setulose-pubescent, the margin usually 10-toothed rarely 7-9-toothed; teeth narrowly lanceolate, setulose, 15 in. long. Corolla white, externally glabrous, rotate, 5-lobed, 25 in. across. Ovary and style glabrous. Fruit globose, yellow, 25 in. in diam., resting on the saucer-shaped calyx with persisting teeth. Seeds 1 in. in diam., almost smooth. Dun. in DC. Prod. XIII. 178; Kurz For. Flor. Burm. II. 224; Clarke in Hook f. Flor. Brit. Ind. IV. 232. S. decemdentatum, Roxb. Hort. Beng. 16, and Flor. Ind. I. 565; Wall. Cat. 2614; Miq. Flor. Ind. Bat. II. 643. S. mollissimum, Bl. Bijdr. 698. S. decemfidum, Nees Trans. Linn. Soc. XVII. 43. S. Zollingeri, Dun. in DC. Prod. XIII. 176.

MALACCA: Griffith! SINGAPORE: Wallich (fide Clarke).—DISTRIB. Throughout Indo-China and the Malay Archipelago.

Though so plentiful in the countries both south and north of the Malay Peninsula, this seems very rare in our area where S. Blumei appears to replace it.

6. Solanum ferox, Linn. Sp. Pl. ed. II. 267. An erect prickly shrub, 3 to 10 feet high, with a short soft-wooded trunk 2 to 3 in. thick;

all the younger parts thickly covered with a brownish soft tomentum intermixed with many sharp compressed brownish prickles of unequal Leaves usually sub-opposite, membranous, ovate to nearly orbicular with irregular short triangular acute or blunt lobes; 5 to 9 in. long, 3 to 6 in, wide, the lobes often 1 in. deep; green above, brownish from the tawny tomentum beneath, sparingly beset on midrib and nerves with long compressed prickles; petioles 5 to 25 in. long, prickly. Flowers large, on thickish pedicels clustered in few-flowered sub-umbellate short-peduncled racemes set close below the leaves: peduncles and pedicels densely stellate-tomentose and beset with long acicular hairs. Calux shortly funnel-shaped, densely hirsute, sometimes prickly; lobes ovate-acute, 25 in. long. Corolla white, densely tomentose externally, nearly 1 in. across; lobes oblong-acute. Ovary hairy. Fruit yellow, globose, 1 in. in diam., hispid with acicular hairs, much exceeding the hardly altered calyx. Seeds 12 in. in diam., very slightly scrobiculate. Dun. in DC. Prod. XIII. 255; Kurz For. Fl. Burm. II. 226 (excl. var. B); Mig. Flor. Ind. Bat. II. 646; Clarke in Hook. f. Flor. Brit. Ind. IV. 233. S. lasiocarpum, Bl. Bijdr. 701; Wall. Cat. 2623; Dun. in DC. Prod. XIII. 252. S. hirsutum, Roxb. Hort. Beng. 17, and Fl. Ind. ed. Carey & Wall. II. 253. S. stramonifolium, Dun. in DC, Prod. XIII. 252 (not of Jacq., nor of Wall., nor of Roxb.).

Penang: Wallich! Perak: Sungah Ryah, Kunstler 1022! Gunong Mesah, King's Collector 1026! Singapore: Wallich! Andamans: Port Blair, plentiful. Nicobars: Nancowry, King's Collector!—Distrib. India, Indo-China, S. China, Sumatra, Java.

7. Solanum torvum, Sw. Prod. Veg. Ind. Occ. 47. An erect sparingly armed shrubby perennial, 3 to 6, or at times even 8 to 12 feet high; all parts shortly and sparsely stellate-pubescent, with but few compressed sharp scattered prickles. Leaves usually sub-opposite, membranous, ovate, shortly acuminate, sinuate or lobed, the lobes obtuse or acute, the base truncate very unequal; 2 to 4 in. long, 1.5 to 3 in. across; rather sparingly pubescent above, more closely sometimes scurfily pubescent beneath; petioles 5 to 1 in. long. Flowers medium, in lateral usually extra-axillary corymbose cymes with short pubescent peduncles; pedicels slender, 3 to 4 in. long, pubescent. Calyx sparsely pubescent, 5-toothed, 25 in. long, without prickles, the teeth ovate-lanceolate acute, ·1 in. long, not enlarging in fruit. Corolla white, externally stellate-pubescent, 5 in. across, rotate, 5-lobed, the lobes 3 in. long, lanceolate-acuminate. Ovary glabrous. Fruit yellow, supported by the calyx which becomes glabrous in fruit, globular, 4 in. across. Seeds 2 in. in diam., compressed, minutely granular. Dun. in DC. Prod. XIII. 260; Wight Ic. t. 345; Mig. Flor. Ind. Bat. II.

648; Clarke in Hook. f. Flor. Brit. Ind. IV. 234. S. stramonifolium, Roxb. Flor. Ind. I. 572.

Penang: Wallich! Deschamps! Ridley! Malacca: Griffith!
Perak: King's Collector 1085! Scortechini 60! Singapore: Schomburgk! Hullett! Kunstler 99! Ridley! Andamans: very common.—
Distrib. Malayan Archipelago, Indo-China, Philippines, China, India, Tropical America.

This is often exceedingly like the next species, S. indicum, but is easily distinguished by its white flowers and its considerably larger fruits.

8. Solanum indicum, Linn. Sp. Pl. 187 partly; Nees in Trans. Linn. Soc. XVII. 55. An erect, armed, branching shrub, 4 to 8 feet high; all young parts thickly covered with a short stellate tomentum, with broad, compressed, sharp, slightly recurved prickles. Leaves membranous or thinly herbaceous, ovate, sinuately lobed, the lobes obtuse or acute, the base obliquely truncate; 1.5 to 3 in. long, 1 to 2 in. wide; above minutely tomentose, green; grey from the denser tomentum beneath; petioles 5 to 1 in. long. Flowers medium, in lateral or spuriously terminal racemes about 2.5 to 3 in. long; pedicels ·2 to ·3 in. long, sometimes prickly and grey stellate-pubescent, as are the peduncles. Calyx grey stellate-pubescent, 5-toothed, ·25 in. long, prickly or not; the teeth lanceolate-acute, hardly enlarging in fruit, Corolla blue, externally stellate-pubescent, ·5 in across, rotate, 5-lobed, the lobes ·35 in. long. Ovary glabrous. Fruit yellow or orange, small, supported by the hardly altered calyx, globose, 25 in. in diam. Seeds 15 in. in diam., minutely dotted. Lour. Flor. Cochin-Chin. 131; Roxb. Flor. Ind. I. 570; Wall. Cat. 2626; Wight, Ic. t. 346; Dun. in DC. Prod. XIII. 309; Miq. Flor. Ind. Bat. II. 651; Kurz For. Fl. Burm. II. 226; Clarke in Hook. f. Flor. Brit. Ind. IV. 234. S. violaceum, Jacq. Fragm. 82, t. 133, f. 1 (not of R. Br.). S. cuneatum, Moench Meth. n. 476; Poir. Suppl. III. 743. S. canescens, Bl. Bijdr. 701. S. Junghuhnii, Miq. Flor. Ind. Bat. II. 649.

Penang: Wallich! Selangor: King's Collector 363! Perak: Wray 3077! Andamans: Prain!—Distrib. Throughout S.E. Asia.

This species often is very like S. torvum; it is readily distinguished by its usually, though not invariably, more numerous prickles, by its blue flowers, and its smaller fruits.

9. Solanum Melongena, Linn. Sp. Pl. 186. A stout erect, sparingly armed herb, 2 to 8 feet high; all the younger parts covered with a grey soft tomentum. Leaves membranous, ovate or oblong, irregularly sinuately lobed; 3 to 6 in. long, 2 to 4 in. wide; green above, stellately pubescent beneath with a few prickles on the nerves or sometimes

quite unarmed; petiole 1 in. long. Flowers large, on extra-axillary often paired peduncles, one peduncle with a solitary perfect flower the other with a few-flowered raceme of male flowers; peduncles stellatetomentose, very rarely prickly. Calyx shortly funnel-shaped, densely pubescent; lobes oblong-acute; 25 to 35 in. long, enlarging slightly in fruit, usually armed. Corolla blue, externally pubescent, 1 to 1.25 in. across, 5-lobed, lobes oblong-acute, short. Ovary glabrous; style stellate-pubescent or at times glabrous. Fruit large, ovoid, obovoid, ellipsoid, or cylindric; usually dark purple, often with white spots or streaks, sometimes uniformly white or yellowish, always glabrous, sometimes as much as 6 in. long and always much longer than the calvx. Seeds 12 in. in diam., slightly scrobiculate. Lour. Flor. Cochin-Chin. 130; Roxb. Flor. Ind. I. 566; Mig. Flor. Ind. Bat. II. 653; Clarke in Hook, f. Flor. Brit. Ind. IV. 235. S. insanum, Roxb. Flor. Ind. I. 568. S. undatum, Lamk Eneve. IV. 301; Bl. Bijdr. 700. S. longum, Roxb. Hort. Beng. 16, and Flor. Ind. I. 567. S. pseudo-undatum, Bl. Bijdr. 699. S. ovigerum, Bl. Bijdr. 698. S. Trongum, Lamk Encyc. IV. 308. S. ferox var. Trongum, Kurz For. Flor. Burm. II, 226.

In all the provinces, cultivated; occasionally also as an escape from cultivation or sub-feral (e.g., at Trang, King's Collector 1416!)

The Egg-Plant, or Brinjal, largely cultivated in all warm countries; originally American. As an escape this species tends to become more prickly and to have 3 to 4 fruits on the peduncle, owing to the males being replaced by perfect flowers. In such cases the fruits are much smaller and often approach, or sometimes even attain a globose form.

10. Solanum sarmentosum, Nees Trans. Linn. Soc. XVII. 58. straggling prickly shrub with procumbent zigzag branches, 2 to 3 feet long; all parts sparsely hairy and covered with long, straight, sharp prickles. Leaves membranous, broadly elliptic, sub-pinnatifid, lobes obtuse, sub-glabrescent above, sparsely stellately pubescent and prickly beneath; 4 in. long, 2 in. across, the lobes .75 in. deep; green on both surfaces; petioles 6 in. long. Flowers large, with thickish pedicels on 1-2-flowered, extra-axillary peduncles about 1 in. long, sparsely stellate-pubescent. Calyx with very shortly funnel-shaped tube, lobes ovate-acuminate 2 in. long, sparsely hairy and prickly, much enlarged Corolla blue, externally pubescent, 7 in. across; lobes oblong-acute. Ovary glabrous. Fruit yellow, globose, glabrous, 5 in. across, overtopped by the enlarged caudate-acuminate, adpressed, armed calyx-lobes, '75 in. long and '35 in. wide. Seeds '12 in. in diam., scrobiculate. Dun. in DC. Prod. XIII. 357; Clarke in Hook. f. Flor. Brit. Ind. IV. 236. S. Melongena, Wall. Cat. 2628 (F. only—not of Linn.). S. Jacquini, Miq. Flor. Ind. Bat. II. 651 (not of Willd.).

Penang: Wallich! Perak: Scortechini! Malacca: Griffith. Pahang: Ridley!—Distrib. Malay Archipelago.

11. Solanum aculeatissimum, Jacq. Col. I. 100. An armed slender undershrub, 2 to 3 feet high, with glabrous stems covered with very many long, straight, slender prickles. Leaves only on the upper part of the stems, membranous, ovate, lobed, sparsely hairy; 3 to 5 in. long. Flowers on 1–7-flowered peduncles, that are usually only 1-fruited; peduncles in fruit '75 in. long. Calyx even in fruit small, under '25 in. long, very prickly. Fruit globose, 1.25 in. across, smooth. Seeds '2 in. in diam., extremely compressed, almost winged. Jacq. Icon. I. t. 41; Clarke in Hook. f. Flor. Brit. Ind. IV. 237. S. aculeatissimum var.? denudatum, Dun. in DC. Prod. XIII. 244.

SINGAPORE: G. Thomson.

This is not in Herb. Calcutta. The above meagre description is taken from the accounts of Dunal in the *Prodromus*, and of Clarke in the *Flora of British India*. The specimen to which Clarke refers is one of the "varieties" of Dunal, not the true S. aculeatissimum of Jacquin, and Dunal himself was not satisfied that it is to Jacquin's species of this name that the variety should be referred. As it has not again been reported, it is possible we may have here to deal with an unusual state of some casually introduced and perhaps well-known American species.

2. CAPSICUM, Linn.

Unarmed annual or perennial, glabrous or glabrescent herbs or shrubs. Leaves alternate, entire or repand. Flowers axillary, solitary or several together. Calyx campanulate, minutely 5-toothed, not enlarging in fruit. Corolla-tube short, rotate, limb 5-lobed, valvate in bud. Stamens 5, adnate near base of corolla; anthers oblong, not longer than filaments, dehiscing longitudinally. Ovary 2-celled, rarely 3-celled; style columnar, stigma small. Fruit resembling a berry, but with the calyx at its base; elongated or (rarely) globose. Seeds very numerous, disk-like; embryo peripheric.—Distrib. Species 2 or more, natives of America.

The number of species is doubtful, and depends on the point of view of the reviewer with regard to the many more or less distinct forms assumed by the plants under cultivation; some writers recognise as many as 80, others claim only about 20; more recent authors insist only on 2 species—a perennial (C. frutescens), and an annual (C. annuum), both very variable. Possibly, however, there is but a single very variable species, for in the tropics the forms of C. annuum are often not truly annual, and in temperate regions the perennial tropical forms rarely persist for more than a season.

Pedicels solitary, variously erect or reflexed; fruits erect or spreading or pendent, at least as long as, usually longer than, the pedicels; plants annual or biennial:—

Flowers white; berries at first green, afterwards becoming red, orange or yellow:—

Fruit not globular :-

```
Berries tapering, much longer than broad :-
        Fruit stout, flesh thick, usually mildly pungent; calyx not
        enclosing base of berry
                                                               .. 1. C. annuum.
                                         . .
        Fruit slender, flesh thin, keenly pungent; calyx enclosing (annuum,
                                                               .. VAR. acuminata.
        base of berry
                                       Berries not much if at all longer than broad, usually obtuse;
      calvx not enclosing base of berry :-
        Berries circular in section, sub-conical, ovate or oblong, (annuum,
                                                              .. VAR. abbreviata.
        flesh thin, pungent ...
        Berries swollen, irregularly angled in section, prismatic, (annuum,
        quadrate or oblate, flesh very thick, hardly at all pungent (var. grossa.
    Fruit globular, extremely pungent
                                                                  VAR. cerasiformis.
  Flowers purple; berries at first dark-purple, afterwards becoming
 orange-red, much longer than broad, only slightly pungent; calyx (annuum,
  hardly enclosing base of berry
Pedicels 2 or more, erect; fruit always erect, red, shorter than the
pedicels, pungent; plants perennial; flowers always white or
yellowish-white:-
  Berries elongated, tapering; base embraced by the calyx
                                                               .. 2. C. frutescens.
                                                               ·· (frutescens, var. baccata.
 Berries globose or sub-globose; base seated on the calyx
```

1. Capsicum annuum, Linn. Sp. Pl. 188. An erect branching or rarely simple robust herb 2 to 3 feet high, with slightly ridged branches: glabrous throughout. Leaves membranous, elliptic or ovate, rather long-acuminate, base long-cuneate, prolonged as a wing on upper part of petiole, margin entire; lamina 3 in. long, 75 to 1 in. wide, rarely 1.5 in. wide, green on both surfaces; petiole .25 to .6 in. long. Flowers white or rarely (VAR. nigra) purple; pedicels almost always solitary, though casually there may be more than one in a leaf-axil, always drooping in flower, in fruit rigid, slightly thickened under the enlarging calyx and variously erect, or spreading or recurved and pendent, then '75 to 1 in. long. Calyx glabrous, campanulate, with sinuate-dentate limb, 2 in. across; in fruit enlarging into a shallow cup embracing the lower part of fruit, or saucer-shaped with the base of the fruit resting on it, then often 5 in. across. Corolla rotate, 4 in. across; 5-lobed. Ovary glabrous. Fruit erect, straight, very variable in shape, colour, fleshiness and pungency. Irish Miss. Bot. Gard. Rep. IX. 65.

VAR. typica. Fruit much longer than broad, stout, tapering to the usually narrow apex; flesh thick, mildly pungent; berry resting on the saucer-shaped fruiting calyx; colour variable.

In gardens, occasionally, usually raised from seed imported from Europe.

This variety includes the many mild chillies which do not keep true to their characters when their seed is collected in the tropics.

Var. acuminata, Fingerhuth. Fruit much longer than broad, slender, rarely straight, always tapering to an acute or sub-acute apex; flesh thin, keenly pungent; berry enclosed at the base by the cupular calyx; colour red or orange, or yellow. C. longum, DC. Hort. Monsp. 86; Fingerhuth, Caps. 23, t. 6, 7; Dun. in DC. Prod. XIII. 424. C. frutescens, Roxb. Hort. Beng. 17; Flor. Ind. I. 574; Bl. Bijdr. 704; Clarke in Hook. f. Flor. Brit. Ind. IV. 239.

Cultivated in most of the provinces.

Some of the forms of this variety seem to have been evolved since the introduction of $Capsicum\ annuum\$ to the Eastern Hemisphere.

Var. abbreviata, Fingerhuth. Fruit conoid, ovate or oblong, not much longer than broad, apex usually blunt; flesh thin, pungent; berry resting on the saucer-shaped fruiting calyx; colour variable. C. annuum, Roxb. Flor. Ind. I. 573. C. frutescens, Dun. in DC. Prod. I. 413. Capo Molago, Rheede Hort. Malab. II. 109, t. 56.

Occasionally cultivated.

VAR. grossa, Sendt. Fruit swollen, somewhat angular, prismatic or quadrate or oblate, obtuse, hardly longer than broad; flesh thick, hardly pungent; berry resting on the saucer-shaped fruiting calyx; colour red. C. grossum, Linn. Mant. 47; Willd. Sp. Pl. I. 1051; Roxb. Hort. Beng. 17; Flor. Ind. I. 574; Fingerhuth, Caps. 21; Dun. in DC. Prod. XIII. 422; Miq. Flor. Ind. Bat. II. 659; Clarke in Hook. f. Flor. Brit. Ind. IV. 239.

Occasionally cultivated.

Var. cerasiformis, Mill. Fruit globular, red, flesh thin, very pungent. C. cerasiforme, Roxb. Flor. Ind. I. 574. C. grossum, var. cerasiformis, Clarke in Hook. f. Flor. Brit. Ind. IV. 239.

Sometimes grown in gardens by European residents.

VAR. nigra. Fruit much longer than broad; flesh thin, only slightly pungent; calyx hardly enclosing base of fruit; berry at first dark purple, at length becoming orange-red. C. purpureum, Roxb. Flor. Ind. IV. 239.

Occasionally cultivated.

2. Capsicum frutescens, Linn. Sp. Pl. 189. An erect, much-branching undershrub, 2 to 4 feet high, branches angled, the smaller ones puberulous but soon, like the leaves, becoming quite glabrous. Leaves petioled, membranous, ovate-acute, the base short-cuneate, truncate or rarely sub-cordate, the margins entire; lamina usually 2.5 to 4 in. long, 1.5 in. wide, green on both surfaces; petiole 5 to 75 in. long. Flowers small, white or yellowish-white; pedicels usually 2 to 3, sometimes 4 or more together in leaf-axils, never all of the same age, drooping in

flower and erect, thickened, rigid and somewhat elongated in fruit, 1 to 1.25 in. long. Calyx glabrous; limb truncate with 5 shortly projecting, spreading teeth .12 in. in diam. Corolla .2 in. in diam., rotate, 5-toothed. Ovary glabrous. Fruit erect, narrow to globose, bright red, .2 to .25 in. in diam. Irish Miss. Bot. Gard. Rep. IX. 97.

Var. typica. Fruits ovate or sub-cylindric, acute, '75 in. long, '2 in. in diam. C. frutescens, Wall. Cat. 2642 B.C. C. minimum, Roxb. Hort. Beng. 17, Flor. Ind. ed. Carey & Wall. II. 261, and ed. propr. I. 574; Wall. Cat. 2641; Blanco, Flor. Filip. 133; Dun. in DC. Prod. XIII. 415; Miq. Flor. Ind. Bat. II. 659; Clarke in Hook. f. Flor. Brit. Ind. IV. 239. C. fastigiatum, Bl. Bijdr. 705; Nees Trans. Linn. Soc. XVII. 64; Dun. in DC. Prod. XIII. 416; Wight Ic. t. 1617; Miq. Flor. Ind. Bat. II. 659; Bentl. & Trim. Med. Pl. t. 188.

In all the provinces, cultivated and as an escape.

VAR. baccata, Irish l.e. 99. Fruit elliptic-obtuse or globose, 25 to 3 in. long, 25 in. in diam. Capsicum baccatum, Linn. Ment. 46; Ham. in Wall. Cat. 2644. C. angustifolium, Dun. in DC. Prod. XIII. 420.

NICOBARS: cultivated, Jelinck 137! 138!

3. Physalis, Linn.

Annual or perennial herbs. Leaves alternate, entire sinuate or shortly lobed. Pedicels axillary, solitary. Calyx campanulate, 5-partite in flower, the tube much enlarged and inflated in fruit, loosely enclosing the berry; teeth small, connivent. Corolla campanulate, yellow. Stamens 5, attached near base of corolla; anthers oblong, shorter than filaments, dehiscing longitudinally. Ovary 2-celled; style columnar; stigma obscurely 2-lobed. Fruit berry-like, globose. Seeds few or many, disk-like; embryo peripheric.—Distrib. Species about 34, mostly tropical American.

Physalis minima, Linn. A herbaceous pubescent or glabrescent annual, erect or with procumbent straggling branches, 6 to 15 in. high. Leaves petioled, ovate, sinuate angular or hardly lobed; 2 in. long, ·75 in. wide, green on both surfaces; petioles 1 in. Flowers small, axillary, solitary; pedicels ·25 to ·5 in. Calyx hirsute or glabrescent; in flower ·1 to ·2 in., with lanceolate lobes as long as tube, in fruit ·75 to 1 in., ovoid or sub-globose, 5-10-ribbed, the teeth sub-connivent and little altered. Corolla yellow, ·25 in. across, glabrous, campanulate, 5-toothed. Ovary glabrous. Fruits yellow, globose, ·5 in. across, completely enveloped by the accrescent calyx. Seeds very many, ·1 in. in diam., discoid, reticulated, hardly scabrous.

Var. typica; calyx not distinctly angled, all parts more or less pubescent. P. minima, Linn. Sp. Pl. 183; Nees in Trans. Linn. Soc.

XVII. 69; Roxb. Flor. Ind. I. 563; Dun. in DC. Prod. XIII. 445; Clarke in Hook. f. Flor. Brit. Ind. IV. 238; Miq. Flor. Ind. Bat. II. 664. P. parviflora, R. Br. Prod. 447. P. divaricata, Don Prod. 97. P. villosa, Roth Nov. Sp. 122. P. Rothiana, Roem. & Schult. Syst. IV. 677. P. Hermanni, Dun. in DC. Prod. XIII. 444.

PERAK: Scortechini! MALACCA: Griffith! ANDAMANS: common in waste places.—DISTRIB. A cosmopolitan tropical weed.

Var. indica, Clarke Flor. Brit. Ind. IV. 238; calyx distinctly 5-angled, all parts nearly glabrous. C. indica, Lamk Encyc. Meth. II. 102; Nees in Trans. Linn. Soc. XVII. 70; Dun. in DC. Prod. XIII. 443; Miq. Flor. Ind. Bat. II. 662. P. pseudoangulata, Bl. Bijdr. 706; Miq. Flor. Ind. Bat. II. 663. P. angulata, Griff. Notul. IV. 96. Nicandra indica, Roem. & Schult. Syst. IV. 632.

PERAK: Kota Bahru, Kunstler, 568! Ipoh, Curtis 3190! Penang: Deschamps! common. Selangor: Ridley 10548! Nicobars: coasts, common.—Distrib. India generally.

The Cape Gooseberry, or Winter Cherry (Physalis peruviana), is cultivated in European gardens in the cold weather.

4. DATURA, Linn.

Suffruticose, rank-smelling, glabrous or minutely pubescent herbs. Leaves large, entire, sinuate or deeply toothed. Pedicels solitary, flowers very large, purple or white. Calyx long-tubular, herbaceous, apex 5-toothed; in fruit circumscissile above the base. Corolla narrowly tubular-funnel-shaped; throat widened, limb plaited, entire or shortly lobed. Stamens attached near base of tube, filaments filiform; anthers included, linear, dehiscing longitudinally. Ovary 2-celled, or 4-celled by the formation of spurious dissepiments; style filiform; stigma 2-lobed. Fruit a capsule, ellipsoid, 4-celled, spinous, more or less completely 4-valved. Seeds very many, compressed, rugose; embryo peripheric.—Distrib. Species 10, temperate and tropical.

Datura fastuosa, Linn. Syst. ed. X. 932. A coarse annual, 3 to 8 feet high, all parts glabrescent or very faintly puberulous. Leaves petioled, membranous, ovate, entire or deeply toothed, glabrous, green; 6 to 8 in. long, 3 to 4 in. across, base unequal; petioles 1 in. Flowers very large, solitary, pedicels 25 to 5 in., erect in flower, recurved in fruit. Calyx tubular, 2.5 to 3 in. long, 5 in. wide, lobes lanceolate, 25 in. long. Corolla purple or white, 7 in. long, base 5, throat 1.5, limb 3 to 5 in. in diam., shortly 5-6-toothed. Ovary glabrous. Capsules sub-globose, 4-celled, equally spinous on all sides, irregularly dehiscent

near apex, supported by the persistent base of calyx; 1.25 to 1.5 in. in diam. Seeds 25 in. diam.

VAR. typica; corolla purple. D. fastuosa, Linn. Syst. ed. X. 932; Roxb. Flor. Ind. I. 561; Wall. Cat. 2638; Nees in Trans. Linn. Soc. XVII. 74; Dun. in DC. Prod. XIII. 542; Miq. Flor. Ind. Bat. II. 669; Clarke in Hook. f. Flor. Brit. Ind. IV. 242. D. Hummatu, Bernh. in Linn. Litteraturber. (1883) 141.

VAR. alba, Clarke in Flor. Brit. Ind. IV. 243; corolla white or cream-coloured. D. alba, Nees in Trans. Linn. Soc. XVII. 73; Wight Ic. t. 852; Dun. in DC. Prod. XIII. 542; Miq. Flor. Ind. Bat. II. 667. D. Metel, Roxb. Flor. Ind. I. 561; Wall. Cat. 2639 (not of Linn.).

PERAK: Larut, Scortechini! Ulu Bubong, King's Collector! SINGA-PORE: Hullett!—DISTRIB. Tropical Africa, S.E. Asia.

The purple-flowered variety has not been sent to Calcutta from any of the provinces. Kunstler says that the white one is "not native" in Perak.

5. NICOTIANA, Linn.

Erect, viscid-pubescent herbs, shrubs, or trees. Leaves entire or sinuate. Racemes paniculate, terminal or sub-terminal. Calyx tubular or ovoid, 5-fid. Corolla funnel-shaped; lobes 5, induplicate in bud. Stamens attached to lower part of corolla-tube, filaments filiform; anthers ovate, dehiseing longitudinally. Ovary 2-celled; style filiform; stigma shortly 2-fid. Fruit a capsule, 2-celled, or rarely spuriously almost 4-celled; valves separating to their middle, often again splitting. Seeds very many, small, scarcely compressed; embryo nearly straight.—Distrib. Species about 35; American, Australian, Polynesian.

NICOTIANA TABACUM, Linn. Sp. Pl. 180. A herb 2 to 3 feet high branching upwards, all parts glandular-pubescent. Leaves large, sessile or sub-amplexicaul, ovate-lanceolate, acute, the lower decurrent; 4 to 8 in. (the lower sometimes 12 to 15 in. long) by 2 to 3 in. across; tapering to the cuneate base. Flowers large, in compound corymbs with short ultimate bracteate branchlets. Calyx campanulate, 5 in. long, 3 in. wide, teeth 5, triangular-lanceolate, 2 in. long. Corolla pink or pale-rose, linear-funnel-shaped, 1.75 to 2 in. long, limb 1 in. across, lobes spreading ovate, sub-acuminate. Capsule ovate, .75 in. long, 5 in. in diam., slightly exceeding calyx. Seeds small. Gaertn. Fruct. I. 264, t. 55; Lamk Ill. t. 113; Dun. in DC. Prod. XIII. 557; Miq. Flor. Ind. Bat. II. 670; Clarke in Hook. f. Flor. Brit. Ind. IV. 245.

In all the provinces, cultivated.

A native of America, cultivated in all warm countries. The common Tobacco.

Order LXXXIII. SCROPHULARIACEÆ.

[By D. Prain.]

Herbs or shrubs, occasionally epiphytic, sometimes semi-parasitic. Leaves all or only the lower opposite, rarely all alternate or whorled. occasionally all radical, sub-rosulate; stipules 0. Flowers hermaphrodite, usually irregular; inflorescence centripetal or composite. Calyx inferior, 5-, rarely 4-lobed or -partite. Corolla hypogynous, more or less 2-lipped or occasionally personate; upper lip entire or 2-lobed. lower 3-lobed. Stamens epipetalous, usually 4, didynamous or rarely sub-equal, occasionally only 2, very rarely 5; anthers 2-celled, cells distinct or apically or entirely confluent, or 1-celled by abortion, often when stamens didynamous with anthers connivent and sometimes with their apices connate in a posterior and an anterior pair. Disk annular, cupular, or glandular. Ovary superior, 2-celled; ovules usually numerous in each cell, anatropous or amphitropous; style simple; stigma capitate or dilated, simple; occasionally 2-lobed or 2-lamellate. Fruit usually a capsule, rarely a berry; placentas sometimes persistent on a central axis, at others attached to margins of valves. Seeds small with a lateral or ventral hilum; albumen fleshy, rarely absent; embryo straight or curved.—DISTRIB. Species 2,000 or more, in all regions.

Angelonia grandiflora, C. Morr., an American species, has become naturalised as an escape from gardens in Selangor (Goodenough in Herb. Ridley 10486); it has long been similarly naturalised in Tenasserim and the Irawadi Delta, and has more recently become established in the Gangetic Delta.

Corolla with upper lip or two upper lobes outmost in bud :-		
Stamens 4, fertile:—		
All 4 filaments inserted within corolla-tube :—		
Trees or epiphytes	1.	WIGHTIA.
$\operatorname{Herbs} :=$		
Throat of corolla plicate, forming a 2-lobed palate; anther-		
cells contiguous, divaricate	2.	Mazus.
Throat of corolla not plicate:—		
Anther-cells discrete, stipitate; corolla distinctly 2-		
lipped:─		
Upper lobe of calyx distinctly exceeding the others;		
2 or sometimes all the anthers with one cell imperfect	3.	ADENOSMA.
Upper lobe of calyx hardly if at all exceeding the		
others; all 4 stamens with perfect anthers	4.	LIMNOPHILA.
Anther-cells contiguous; lateral calyx-lobes much		
narrower than the other three; corolla sub-equally		
5-lobed	5.	HERPESTIS.
Only 2 posterior filaments inserted within corolla-tube; the		
anterior pair inserted on corolla-throat :		
	6.	TORENIA.

Calyx without wings or ridges :—		
Calyx-segments narrow	7.	VANDELLIA.
Calyx-segments broad	8.	ARTANEMA.
Stamens only 2 posterior fertile, inserted within corolla-tube;		
anterior pair reduced to staminodes on corolla-throat:—		
Calyx 4-lobed, the outer lobes very broad	9.	CURANGA.
Calyx 5-lobed, the lobes all narrow	10.	Bonnaya.
Corolla with upper lip or 2 upper lobes inmost in bud; rarely		
lobes imbricate:—		
Corolla-tube very short; lobes 4, sub-equal, imbricate; stamens		
	11.	SCOPARIA.
Corolla-tube elongated; lobes 5, 2-labiate:—		
Calyx tubular, 5-lobed	12.	STRIGA.
Calyx spathaceous, split in front	13.	CENTRANTHERA.

1. Wightia, Wall.

Large epiphytic climbers, eventually becoming trees. Leaves mostly or all opposite, quite entire, coriaceous. Flowers in usually axillary, often thyrsoid racemes; large, rosy or purple, pubescent. Calyx campanulate, irregularly 3-5-lobed. Corolla-tube incurved, upper lip erect, 2-lobed, lower spreading, 3-fid. Stamens 4, didynamous, ascending, exserted; anthers oblong, sagittate, cells parallel. Style long, tip incurved; stigma simple. Capsule oblong-ovoid, septicidal, many-seeded, valves long, separating from the placentiferous axis, which is 2-partite or entire. Seeds linear, ascending, nucleus slender, testa membranous, broadly winged all round; albumen 0; embryo straight.—Distrib. Species 3, all S.E. Asiatic.

The species of this genus exhibit the primarily epiphytic but subsequently arboreal habit characteristic of many species of *Ficus*. Though often loosely spoken of as parasites, and though, as a matter of fact, they frequently strangle the trees on which they become established, epiphytes of this class are not parasites in the physiological sense.

Wightia borneensis, Hook. f. in Ic. Plant. XV. 35, t. 1444 (1883). A tree, 20 feet in height and upwards, commencing life as an epiphyte and flowering most freely in that condition. Leaves opposite, thinly coriaceous, glabrous as are the lenticellate branchlets, drying brown, margin entire, outline elliptic, apex obtusely acuminate, base cuneate, narrowed to the petiole, main-nerves 2-3-jugate; length 3 to 4 in., breadth 1.25 to 1.75 in.; petiole .75 in. long. Flowers opposite or whorled on the rachis of axillary or terminal racemes, pedicels slender, rigid, spreading, 5 in. long; rachis stout, glabrous, erect, 6-10-flowered, 3 to 6 in. long. Calyx campanulate, margin entire, .4 in. across. Corolla trumpet-shaped, incurved, purple, densely beset with a fine stellate tomentum, 2 in. long, lobes rounded, throat slightly enlarged. Stamens inserted near base of corolla; filaments slender, far-exserted;

anthers sagittate. Ovary glabrous; style filiform; stigma simple. Fruit not seen.

PERAK: Larut Hill at 3,000 feet, Derry (Herb. Curtis, n. 3710)!—DISTRIB. Borneo.

The solitary Perak specimen agrees well with a specimen from Borneo in Herb. Kew; as our Perak example is destitute of leaves the description of these is based on a second Bornean example of the plant. The species is most readily distinguished from the other two known species by its entire calyx-limb.

2. Mazus, Lour.

Small herbs, often surculose. Leaves rosulate or opposite below, opposite or alternate above. Flowers in terminal, sub-secund racemes; bracts minute or 0; bracteoles 0. Calyx campanulate, 5-fid; lobes large, leafy. Corolla 2-lipped; tube short, upper lip erect, ovate, 2-fid; lower longer, spreading, 3-fid; throat with a 2-lobed palate. Stamens 4, didynamous; anther-cells contiguous, divaricate. Ovary 2-celled; style short; stigma 2-lamellate; ovules numerous. Capsule globose or compressed, loculicidal, 2-valved, included. Seeds many, ovoid, very minute.—Distrib. Species about 5, Asiatic and Australian.

Mazus Rugosus, Lour. Flor. Cochin-Chin. 385. A small annual glabrous or sparingly hirsute herb. Leaves many, radical, obovatespathulate, irregularly coarsely crenate, narrowed to a short petiole, .75 to 3 in. long. Scapes numerous from the root, 2 to 10 in. long, leafless or with a few alternate spathulate leaves, with terminal racemes 1 to 6 in. long, the pedicels slender, 25 to 5 in. long, usually without bracteoles. Calyx campanulate, 25 in. long, lobes ovate-lanceolate, acute, half as long as tube, spreading in fruit. Corolla pale blue, 3 in. long. Capsule 2 in. long, included in the calyx; calyx-mouth in front ·3 to ·5 in. across. Seeds very minute; testa pale straw-coloured. Benth. in DC. Prod. X. 375; Boiss. Fl. Orient. IV. 424; Miq. Flor. Ind. Bat. II. 677; Hook. f. Flor. Brit. Ind. IV. 259. M. bicolor, Benth. in Wall. Cat. 3913. M. vandellioides, Hance in Walp. Ann. III. 193. Lindernia japonica, Thunb. Flor. Japon. 253. Hornemannia bicolor, Willd. Enum. Hort. Berol. 654; Reichb. Icon. Exot. 25, t. 37. Columnea tomentosa, Roxb. Flor. Ind. III. 98. Stemodia tomentosa, G. Don Gen. Syst. Gard. IV. 842. Tittmannia obovata, Bunge Enum. Pl. Chin. 279. Vandellia obovata, Walp. Act. Acad. Leopold. XIX., Suppl. I. 394. Gratiola goodeniæfolia, Hornem. Hort. Hafn.

SINGAPORE: a garden weed, Ridley!—DISTRIB. E. and S.E. Asia generally.

3. Adenosma, R. Br.

Annual, villous or glandular aromatic herbs. Leaves opposite, rugose, crenulate. Flowers axillary or in leafy spikes, racemes or

heads; bracteoles conspicuous or absent. Calyx deeply 5-lobed; lobes imbricate, the upper the largest; sometimes in fruit all enlarged. Corolla 2-lipped; upper lip erect, entire or notched, outmost in bud; lower 3-lobed, spreading; throat not plicate; tube cylindric. Stamens 4, didynamous, included; anther-cells discrete, stipitate, one cell of each anterior stamen or of all four stamens empty. Ovary 2-celled; ovules in each cell numerous; style filiform below, winged upwards under the entire or 2-lamellate stigma. Fruit an ovoid, ellipsoid, or lanceolate 2-grooved and 4-valved capsule, opening both loculicidally and septicidally. Seeds many, minute, reticulate.—Distrib. Species about 10, in S.E. Asia and Australia.

1. Adenosma ovatum, Benth. in Hook. fil. Flor. Brit. Ind. IV. 263. A puberulous or glabrate herb, branched from the base; branches rooting below, prostrate or ascending, 6 to 18 in. long. Leaves ovate-obtuse, crenate-serrate, base wide-cuneate, rounded or truncate; blade '75 in. long, '5 in. wide; petiole '3 in. Flowers axillary, sessile; bracts lanceolate, shorter than the calyx. Calyx of 5 almost free sepals; in flower herbaceous, sub-equal; in fruit membranous, reticulate, pubescent, the 3 outer enlarged, '35 in. wide, ovate-cordate, the 2 inner unaltered, narrow lanceolate, all '25 in. long. Corolla blue. Capsule lanceolate, about as long as the sepals but hidden by the enlarged outer ones. Herpestis ovata, Benth. Scroph. Ind. 30; Wall. Cat. 3896. H. javanica, Bl. Bijdr. 748. Pterostigma ovatum, Benth. in DC. Prod. X. 380; Miq. Flor. Ind. Bat. II. 678.

PERAK: Gunong Tundul, Ridley 9444! PENANG: Waterfall, Curtis! MALACCA: Griffith! SINGAPORE: Bukit Timah, Ridley 6894! "a garden weed," Ridley 8910!—DISTRIB. Indo-China, Malay Archipelago.

2. ADENOSMA INOPINATUM, Prain Journ. As. Soc. Beng. LXXII. 2, 16. A pubescent herb, branched from the base; branches rooting below, ascending, 6 to 18 in. long. Leaves ovate-acute, serrate, base cuneate; blade 1 to 1.5 in. long, .75 to 1 in. wide; petiole .3 in. Flowers axillary, sessile; bracts lanceolate, shorter than calyx. Calyx

of 5 almost free sepals; in flower herbaceous, sub-equal; in fruit membranous, reticulate, the 3 outer enlarged, 25 in. wide, ovate-lanceolate with truncate bases, the 2 inner unaltered, narrow lanceolate, all 25 in. long. *Corolla* blue. *Capsule* lanceolate, about as long as the sepals but hidden by the enlarged outer ones.

Malacca: Griffith! Singapore: Anderson! King's Collector!

Very nearly allied to A. ovatum, Benth., and A. subrepens, Benth. It differs from both by its acute leaves, but except in this respect and as regards its distribution it is hardly separable from A. subrepens of Ceylon. From A. ovatum of Tenasserim, with which it has been confused, it further differs in its larger size, coarser habit of growth, and much narrower outer sepals. It has also been confused with A. corruleum, from which it differs by its flowers being all axillary and by its enlarged fruiting sepals.

3. ADENOSMA CAPITATUM, Benth. in Hook. f. Flor. Brit. Ind. IV. 264. A stout, erect, glandular-villous herb, 1 to 2 feet high. Leaves ovate or oblong, sub-acute, serrate, often reflexed; base cuneate; blade 1 to 2 in. long, 5 to 75 in. wide; petiole very short. Flowers in dense cylindric or globose terminal or axillary heads, with basal involucres of floral leaves; peduncles 1 in. or less, sometimes in the lower clusters sub-obsolete and the flowers in axillary whorls; heads usually 5 in. across, sometimes longer up to 4 in. long; bracts linear, hardly exceeding the sepals. Calyx of 5 almost free sepals, villous with long hairs, 25 in. long, the uppermost ovate-lanceolate, broader than the other lanceolate 4. Corolla blue. Capsule ovoid, 2 in. long. Stemodia capitata, Benth. in Bot. Reg. under t. 1470; Wall. Cat. 3926. Pterostigma spicatum, Benth. Scroph. Ind. 21. P. capitatum, Benth. Scroph. Ind. 31, and in DC. Prod. X. 380. Erimus bilabiatus, Roxb. Fl. Ind. III. 92.

Prov. Wellesley: King! King's Collector. Penang: Wallich; Deschamps! Curtis! Singapore: King! Ridley! Malacca: Cuming! Ayer Keroh, Ridley! Griffith; Wallich. Negri Sembilan: Kwala Pedas, Ridley! Pahang: Ridley!—Distrib. Throughout S.E. Asia.

4. ADENOSMA CCRULEUM, R. Br. Prod. 443. An erect herb, 1 to 2 feet high, viscidly pubescent. Leaves ovate-acute, crenate, base rounded or cordate; blade 1.5 to 2.5 in. long, 1 to 2 in. wide; petiole .5 to 1 in. long. Flowers in long slender strict spikes; bracts lanceolate, about as long as calyx. Calyx of 5 almost free sepals, the upper lanceolate the rest linear, not very greatly altered in fruit. Corolla blue. Capsule lanceolate, rather longer than the sepals. Benth. Flor. Austral. IV. 484; Hook. f. Flor. Brit. Ind. IV. 263. Pterostigma villosum, Benth. Scroph. Ind. 21, and in DC. Prod. X. 380 partly; Miq Flor. Ind. Bat. II. 678. P. strictum, Griff. Not. IV. 96; Ic. Pl. Asiat. t. 417, f. 3. Stemodia carulea, Benth. in DC. Prod. X. 381. Herpestis lanuginosa, Bl. Bijdr. 747.

SELANGOR: Ridley! PERAK: Scortechini! Wray! MALACCA: Griffith! Cuming! Maingay; Hervey! SINGAPORE: Cuming! Wallich.
—DISTRIB. Indo-China, Malaya, Australia.

Scortechini notes on this, "aromatic; most likely introduced." It appears, however, to be native.

5. Adenosma hirsutum, Kurz Journ. As. Soc. Beng. XLV. 2. 143. A stout, erect, villous herb, 2 to 3 feet high. Leaves ovate or elliptic, sub-acute, serrate, base cuneate; blade 1 to 2 in. long, 5 to 75 in. wide; petiole very short or 0. Flowers in dense cylindric or oblong heads, often ternate, usually peduncled, with closely imbricate hirsute leafy bracts; peduncles sometimes 1.5 in. long; heads 1 to 3 in. long, 75 to 1 in. wide; bracts ovate-acute, serrate, 4 to 6 in. long. Calyx of 5 almost free villous linear sepals, 25 in. long. Corolla blue. Capsule ovate, abruptly beaked, as long as calyx. Pterostigma hirsutum, Miq. Flor. Ind. Bat. Suppl. 562. P. villosum, Miq. 1.c. (not of Benth.).

PROVINCE WELLESLEY: Curtis 2238! Ridley 6977! NICOBARS: Kamorta, Kurz!—Distrib. Sumatra (Teysmann 1157), Bangka (Teysmann 3429), Borneo (Motley, n. 215).

A coarser plant than A. capitatum, with leafy bracts throughout the spikes.

4. LIMNOPHILA, R. Br.

Herbs of marshes and pools, glabrous or pubescent, aromatic. Leaves with transparent dots, opposite or whorled, toothed or cut, when submerged frequently laciniate-multifid. Flowers solitary axillary, sessile or pedicelled, or passing into terminal spikes or racemes; bracts leafy; bracteoles small or obsolete. Calyx 5-partite; lobes narrow, imbricate, all equal or the upper largest. Corolla 2-labiate; upper lip outmost, sub-erect, entire or 2-fid; lower spreading, 3-lobed; throat not plicate; tube cylindric. Stamens 4, didynamous, included; anther-cells all perfect, usually discrete, stipitate, occasionally contiguous. Ovary 2-celled; ovules in each cell numerous; style slender, with deflexed tip and 2-lamellate stigma. Fruit an ovoid or oblong capsule, with both septicidal and loculicidal dehiscence, the placentiferous septum separating from the valves. Seeds many, minute, angular and truncate, reticulate.—Distrib. Species about 25, in the tropics of the Eastern Hemisphere and Australia.

Leaves never pinnatifid above, very rarely so even on lower portion of stem :—

Flowers sessile :-

Leaves at least 1 in. long :-

Leaves petioled, 2 to 3 in. long, pubescent or glabrous .. 1. L. Roxburghii.

Leaves sessile, 1 to 2 in. long, softly pubescent 2.	L. balsamea.
Leaves glabrous, never exceeding 5 in. long 3.	L. micrantha.
Flowers pedicelled:—	
Leaves hirsute:—	
Leaves usually opposite, rarely 3-nate, never more than	
·75 in. long; flowers always axillary, solitary 4.	L. villosa.
Leaves usually 3-4-nately whorled, rarely opposite, never	
less than 1.5 in. long; flowers usually cymose or panicu-	
late, rarely axillary, solitary 5.	L. hirsuta.
Leaves glabrous :—	
Leaves cuneate at base, always opposite; flowers axillary,	
solitary:—	
Stems creeping; branches many, divaricate; pedicels in	
fruit erect 6.	L. pygmæa.
Stems erect, usually simple; pedicels in fruit recurved 7.	L. erecta.
Leaves half-amplexicaul at base, often 3-4-nately whorled,	والأحلال أنويان
flowers usually in many-flowered racemes, rarely axillary,	
solitary 8.	L. gratissima.
Leaves mostly or all lobulate or pinnatisect, or capillary multi-	
(fid:	
Flowers sessile or shortly pedicelled; uppermost leaves entire:—	
	L. sessiliflora.
(10.	L. heterophylla,
Flowers passing into a terminal spike	L. heterophylla, VAR. reflexa.
Flowers all pedicelled, the pedicels exceeding the calyx; all the	
leaves capillary multifid 11.	L. Grifithii.
그렇게 살해 주어 하는 말이 얼마를 가지고 하는 일이 어려고 있어 들었다고 있다.	

1. Limnophila Roxburghii, G. Don Gen. Syst. IV. 543 (not of Benth.). A stout glabrous or pubescent aromatic herb, with a creeping rootstock and with decumbent rooting base, giving off numerous erect stems 1 to 2 feet high. Leaves opposite, petioled, elliptic or ovate, obtuse or sub-acute, margin crenulate, base cuneate, punctate beneath, nerves distinct, 8 to 10 pairs; length up to 4 in., width to 2 in.; petiole '75 in. Flowers sessile, in axillary peduncled heads, rarely solitary. Calyx hirsute, '2 in. long; lobes lanceolate, finely acuminate in fruit, not striate. Corolla '35 in. long, purplish-blue with a yellow throat. Capsule '2 in. long, elliptic, sub-acute. Hook. f. Flor. Brit. Ind. IV. 265. L. Menthastrum, Benth. in DC. Prod. X. 386; Maxim. Mel. Biol. IX. 406. Herpestis rugosa, Roth Nov. Sp. 290. Capraria gratissima, Roxb. Fl. Ind. III. 92 (in part). Stemodia Menthastrum, Benth. Scroph. Ind. 23; Wall. Cat. 3927. Adenosma triflora, Seem. Fl. Vit. 184 (not of Nees). Eclipta scabriuscula, Wall. Cat. 3212.

Kedah: Langkawi, at Coah, Curtis 2556!—Distrib. Himalaya, from Chamba eastward, N. and C. India, Indo-China, Philippines, China.

The bases of the stems are often submerged, and besides the fibrous roots then emitted the lower nodes at times have multifid submerged leaves. The plant smells strongly of Aniseed.

2. Limnophila Balsamea, Benth. in DC. Prod. X. 386. A stoutish, softly pubescent herb; stem 1 to 2 feet high. Leaves opposite, elliptic, sub-acute, narrowed from the middle to the base with margin entire, beyond the middle obscurely crenulate, punctate beneath, nerves slender, 3 to 5 pairs; length up to 2 in., width to 1 in.; petiole 0. Flowers in short peduncled axillary heads or spikes. Calyx hirsute, 15 in. long; lobes lanceolate, finely acuminate; in fruit striate. Corolla 35 in. long. Capsule 2 in. long, broadly elliptic, obtuse. Hook. f. Flor. Brit. Ind. IV. 266. Stemodia balsamea, Benth. Scroph. Ind. 23; Wall. Cat. 3928.

PERAK: King's Collector 1027!—DISTRIB. Indo-China.

3. LIMNOPHILA MICRANTHA, Benth. in DC. Prod. X. 387. A small, stoutish, glabrous herb, creeping below; stem 3 to 6 in. long, branching from the base. Leaves all opposite, crowded, thick, '25 to '45 in. long, margin entire or very sparingly sub-serrate, punctate beneath; nerves obscure; petiole 0. Flowers axillary, sub-sessile, small. Calyx '06 in. long, glabrous; lobes subulate, in fruit striate. Corolla reddish-purple, '12 in. long. Capsule ovate, '08 in. long. Hook. f. Flor. Brit. Ind. IV. 267. Stemodia micrantha, Benth. Scroph. Ind. 23; Wall. Cat. 3936. Herpestris pygmæa, Griff. Notul. IV. 104.

Pahang: Ridley!—DISTRIB. Indo-China, Bengal.

4. Limnophila villosa, Bl. Bijdr. 750. An erect or spreading, subsimple, stoutish or slender, pubescent herb; stems 4 to 6 in. high. Leaves opposite, elliptic-oblong, sub-crenate, 5 to 75 in. long, punctate beneath, nerves obscure; petiole 0. Flowers axillary, solitary, on short pubescent pedicels, 15 in. long, erect in fruit. Calyx hirsute, 15 in. long, lobes lanceolate, acuminate-subulate, in fruit striate. Corolla 2 in. long. Capsule 15 in. long, ovate. Benth. in DC. Prod. X. 388; Miq. Flor. Ind. Bat. II. 681. L. laxa, Benth. in DC. Prod. X. 388 partly. L. pulcherrima, Hook. f. Flor. Brit. Ind. IV. 267. Herpestis pulcherrima, Griff. Notul. IV. 104.

PERAK: Wray 788! MALACCA: Griffith! Cuming! Maingay! Ridley! Hervey! Penang: Tulloh Bahang, Curtis! Ridley 7104! Pahang: Ridley! Singapore: King's Collector! Hullett! Deschamps! Kurz! Ridley! Province Wellesley: King! Salama: Scortechini!—Distrib. Sumatra, Java.

5. LIMNOPHILA HIRSUTA, Benth. in DC. Prod. X. 388. An erect hirsute herb; stem 6 to 8 in. high. Leaves opposite or 3-4-nately whorled, elliptic, linear-oblong or sub-spathulate, 1.5 to 2.5 in. long, apex obtuse, margin serrulate, punctate beneath, nerves few, very indistinct; petiole short or obsolete. Flowers axillary, solitary or cymose or paniculate at the apex of the stem; pedicels 2 to 75 in.

bracteoles minute. Calyx · 3 in. long, hirsute; lobes lanceolate, finely acuminate, in fruit striate. Corolla · 5 in. long. Capsule sub-orbicular, · 25 in. long. Hook. f. Flor. Brit. Ind. IV. 268. L. javanica, A. DC. in DC. Prod. X. 594. Stemodia hirsuta, Heyne, ex Wall. in Cat. 3930; Benth. Scroph. Ind. 24. Ambulia ebracteata, Ham. ex Hook. f. Flor. Brit. Ind. IV. 268.

NICOBARS: Kurz! PERAK: Scortechini! Kunstler! MALACCA: Ridley!—DISTRIB. India, Indo-China, Malay Archipelago, China.

6. LIMNOPHILA PYGMÆA, Hook f. Flor. Brit. Ind. IV. 268. A very small, glabrous, much-branched creeping herb; branches 4 to 6 in. long, divaricate. Leaves opposite, ·3 to ·4 in. long, oblong-lanceolate, apex acute, margin sub-serrate; punctate beneath, nerves very obscure; petiole 0. Flowers axillary, solitary, pedicels slender, ·15 to ·2 in. long, erect in fruit. Calyx ·15 in. long, hirsute, lobes subulate-lanceolate, striate in fruit. Corolla ·2 in. long. Capsule ·15 in., ovate. Herpestis pygmæa, Griff. Notul. IV. 104. Stemodia diffusa, Benth. in Wall. Cat. 3937.

MALACCA: Griffith! Cuming!—DISTRIB. Tenasserim.

7. LIMNOPHILA ERECTA, Benth. in DC. Prod. X. 388. An erect, sub-simple or branched, stoutish glabrous herb; stems 4 to 8 in. high. Leaves all opposite, linear-oblong, 5 to 1 in. long, apex acute, margin sub-serrate except the narrow cuneate base, punctate beneath, nerves obscure; petiole very short or obsolete. Flowers white, axillary, solitary, on short pedicels, 1 in. long, recurved in fruit. Calyx glabrous, 15 in. long, lobes lanceolate, acuminate, in fruit striate. Corolla 2 in. long. Capsule 15 in. long, ovate. Maxim. Mel. Biol. IX. 406; Hook. f. Flor. Brit. Ind. IV. 267. Stemodia gratioloides, Benth. Scroph. Ind. 25; Wall. Cat. 3938.

Perak: Scortechini! Wray! King's Collector! Negri Sembilan: Ridley! Selangor: Ridley! Pahang: Ridley!—Distrib. Indo-China, Bengal, S. China.

8. Limnophila gratissima, Bl. Bijdr. 749. An erect, glabrous herb with a stout stem, 1 to 2 feet high, simple or occasionally branched above. Leaves opposite and ternate, half-amplexicaul, linear-oblong, 1.5 to 2.5 in. long, apex sub-acute, margin serrulate, punctate beneath, nerves few, indistinct; petiole 0. Flowers in axillary and terminal many-flowered racemes, rarely flowers axillary solitary, sometimes the racemes 12 in. long and paniculately branched with the flowers whorled, at others the racemes reduced; pedicels 5 to 1 in. long, glandular; bracteoles minute. Calya 3 in. long, glabrate, lobes lanceolate-acuminate; in fruit calyx hemispherical with lobes striate. Corolla 5 in. long. Capsule oblong, acute, 3 in. long. Benth. Scroph. Ind. 26;

Wall. Cat. 3906; Hook. f. Flor. Brit. Ind. IV. 268. L. punctata, Bl. Bijdr. 750; Benth. in DC. Prod. X. 388; Miq. Flor. Ind. Bat. II. 682; Maxim. Mel. Biol. IX. 406. Gratiola aromatica, Pers. Synops. I. 14. Ambulia aromatica, Lamk Encycl. Meth. I. 128. Rheede Hort. Malab. X. 6.

MALACCA: Griffith. PERAK: King's Collector! Wray!—DISTRIB. S.E. Asia generally, N. Australia.

9. Limnophila sessiflora, Blume Bijdr. 750. A hirsute or rarely glabrate herb; stem stoutish, 4 to 8 in. long. Leaves 3 to 6 in a whorl throughout all lobulate or pinnatisect, or the uppermost very rarely opposite entire, usually about 4 to 5 in. long. Flowers axillary solitary, sessile or shortly pedicelled. Calyx 3 in. long, lobes ovate-acuminate, tube in fruit membranous, hemispheric, not striate. Corolla 5 in. long. Capsule orbicular, turgid, 2 in. across. Benth. Scroph. Ind. 25; Wall. Cat. 3902; DC. Prod. X. 389; Miq. Flor. Ind. Bat. II. 683; Hook. f. Flor. Brit. Ind. IV. 270. Hottonia sessiliflora, Vahl Symb. II. 36.

Kedah: Langkawi, in swamps, Curtis!—Distrib. Throughout S.E. Asia.

10. Limnophila heterophylla, Benth.; var. reflexa, Hook. f. Flor. Brit. Ind. IV. 270. A glabrous herb with a very slender elongated stem, 1 to 1.5 feet long. Leaves towards apex of stem usually opposite, small, rarely over .25 in. long, sessile, half-amplexicaul, oblong, margin crenulate; followed by pinnatifid leaves 4 to 6 in a whorl, .5 in. long; with below these submerged whorled and very finely capillary-multifid leaves, .5 in. long. Flowers axillary solitary, the upper sub-sessile passing into a short leafy spike, the lower pedicelled, with pedicels recurved in fruit and longer than the calyx. Calyx .25 in. long, lobes ovate, very shortly acuminate, in fruit not at all striate; tube in fruit hemispheric, membranous. Corolla .4 in. long. Capsule sub-globose, .3 in. long. L. reflexa, Benth. Scroph. Ind. 25; DC. Prod. X. 389; Wall. Cat. 3904.

MALACCA: Cuming. KEDAH: Curtis 2103!—DISTRIB. (of variety,) Tenasserim: (of type,) throughout S.E. Asia.

This variety differs from the type in having distinctly shorter submerged leaves, and distinctly longer pedicels to the lower flowers.

11. Limnophila Griffithi, Hook. f. Flor. Brit. Ind. IV. 271. A very small herb with creeping tufted stems, sending down long rigid roots and emitting many erect branches, 1 to 2 in. long, sometimes stout and stiff, sometimes slender and flaccid. Leaves 25 to 35 in. long, usually densely whorled and imbricated, multifid. Flowers axillary solitary, on slender pedicels, 35 to 5 in. long, that are deflexed

in fruit. Calyx ·1 in. long, teeth short. Corolla pure white, ·4 in. long. L. sessiliflora, Griff. Notul. IV. 99, t. 418, f. 5 (not of Bl.). L. gratioloides var. myriophylloides, Benth. in DC. Prod. X. 389 partly. Quinquelobus glaber, Benj. in Linnæa XX. 316. Benjaminea glabra, Benj. in Linnæa XX. 761.

Malacca: Griffith! Leman, Cuming! Maingay! Perak: King's Collector!

Griffith's specimens have slightly larger leaf-segments and shorter pedicels than those of Maingay, Cuming, and Kunstler, where the leaf-segments are finely capillary. But Griffith's plant evidently grew on mud, while that of Kunstler was floating in water, and the difference of habitat probably sufficiently explains the difference in foliage. The flowers of the two forms are the same.

5. HERPESTIS, Gaertn. f.

Herbs, glabrous. Leaves often dotted, entire or toothed, or below submerged and multifid. Flowers axillary or racemose; bracteoles small or obsolete. Calyx 5-partite; lobes imbricate, the upper largest, the two lateral inmost often very narrow. Corolla indistinctly 2-lipped; upper lip outmost spreading, 2-lobed or only emarginate, lower 3-lobed; tube cylindric. Stamens 4, didynamous, included; anthers sometimes approximate in pairs; cells contiguous, parallel, not confluent. Ovary 2-celled; ovules in each cell numerous; style dilated at the top; stigma entire or 2-lobed. Fruit a globose or ovoid 2-celled capsule; valves 2 or 4, separating from the placentiferous septum. Seeds many, very minute.—Distrib. Species about 50, throughout the tropics.

Herpestis Monnieria, H. B. & K. Nov. Gen. and Sp. II. 366. A glabrous, rather succulent creeping herb, rooting at the nodes; branches 4 to 10 in. long. Leaves obovate-oblong, spathulate, sessile, obtuse, entire, 5 to 75 in. long. Flowers axillary, peduncles usually 75 to 1 in. long; bracteoles 2. Calyx of 5 nearly free sepals, 2 to 3 in. long, the upper sepal ovate. Corolla white, faintly tinged with blue, 4 to 6 in. long, lobes sub-equal. Capsule ovoid, acute, hidden by the sepals, 15 to 25 in. long. Seeds minute, irregular; testa pale. Benth. Scroph. Ind. 30, and in DC. Prod. X. 410; Wall. Cat. 3900; Dalz. & Gibs. Bomb. Flor. 178; Miq. Flor. Ind. Bat. II. 685; Bot. Mag. t. 2557; Boiss. Flor. Orient. IV. 426; Hook. f. Flor. Brit. Ind. IV. 272. H. spathulata, Bl. Bijdr. 748. Gratiola Monnieria, Linn. Cent. Pl. II. n. 120; Roxb. Cor. Pl. II. 41, t. 178, and Flor. Ind. I. 141. Septis repens, Lour. Flor. Cochin-Chin. 392. Bramia indica, Lamk Encyc. I. 459. Rheede Hort. Malab. X. t. 14.

MALACCA: Hervey! Johore: Hullett! Singapore: Kurz! Ridley!—Distrib. Throughout the tropics.

6. Torenia, Linn.

Herbs, glabrous or pubescent. Leaves opposite, entire or crenate or serrate. Flowers often showy, axillary, or in terminal or pseudo-axillary racemes or umbels; bracteoles 0. Calyx 2-lipped or 3-5-toothed, 3-5-keeled or -winged or -folded. Corolla 2-lipped; upper lip outmost erect, concave or pinched, notched or 2-fid; lower larger spreading, 3-lobed; tube cylindric, somewhat curved, dilated upwards. Stamens 4, didynamous; upper pair included inserted on corolla-tube; lower inserted on throat, appendaged or not at base, and connivent under upper lip; anthers contiguous or connate in pairs, cells often confluent. Ovary 2-celled; ovules in each cell numerous; style slender; stigma 2-lamellate. Fruit a linear or oblong, included septicidal capsule; valves separating from the placentiferous septum. Seeds many, rugose or cancellate.—Distrib. Species 20, Tropical Asiatic and African, one American.

Calyx very distinctly winged :-Fruiting calyx sub-orbicular, as broad as long; stems prostrate and rooting .. 1. T. polygonoides. Fruiting calyx longer than broad; stems erect:-Wings broad distinctly decurrent on the pedicels; corolla very little exserted; bracteoles very small; pedicels shorter 2. T. peduncularis. Wings narrow hardly decurrent on the pedicels; corolla distinctly exserted; bracteoles large; pedicels as long as or longer than the calyx .. 3. T. ciliata. Calyx hardly or not at all winged :-Flowers all axillary:-Stems and leaves glabrous; calyx deeply lobed, faintly .. 4. T. asiatica. A • • 1 Stems and leaves hirsute; calyx wingless, shortly lobed ... 5. T. Benthamiana. Flowers in terminal racemes; stems and leaves hirsute; calyx wingless, shortly lobed 6. T. flava.

1. Torenia polygonoides, Benth. Scroph. Ind. 39. A slender straggling herb; branches 6 to 12 in. long, decumbent and often rooting at the nodes; all parts glabrous. Leaves orbicular-ovate, serrate; lamina 4 to 5 in. long, 35 to 45 in. wide, apex acute or sub-acute, base cuneate; petiole slender, 25 in. long. Flowers axillary on 2-4-flowered peduncles; pedicels 25 in. long, slender; bracteoles minute. Calyx tubular with very wide wings, in fruit sub-orbicular 3 in. in diam. Corolla 35 in. long, white or white and pink, distinctly exserted. DC. Prod. X. 409; Miq. Flor. Ind. Bat. II. 688; Hook. f. Flor. Brit. Ind. IV. 276. T. cardiosepala, Benth. in DC. Prod. X. 409. Herpestis polygonoides, Benth. in Wall. Cat. 3897.

SINGAPORE: Wallich 3897! King's Collector! Hullett! Murton, Kuntze! Schomburgk! Anderson! Kurz! Malacca: Maingay! Griffith! Goodenough! Penang: Bouton; Deschamps! Perak: Gapis Pass, Curtis 2683!

2. Torenia peduncularis, Benth. in Wall. Cat. 3956. An erect annual herb 1 to 2 feet high; branches acutely 4-gonous, uniformly hairy upwards, below ciliate only on the angles with recurved hairs. Leaves ovate-lanceolate, base cordate, apex acuminate, margin serrate; lamina membranous 1 to 2 in. long, 5 to 1 in. wide, sparingly hairy on both surfaces; petiole slender, sparsely hirsute, 5 to 75 in. long. Flowers axillary solitary, or the uppermost in a sub-umbellate corymb or a terminal raceme, the lowest in the raceme leaf-opposed; pedicels 3 in., in fruit 5 in. long, thickened upwards, shorter than the calyx; bracteoles linear-subulate small. Calyx-tube narrow-ovate, 6 in., in fruit 85 in. long, wings broad, decurrent on the pedicel, the margins ciliate. Corolla 75 in. long, little exserted, tube yellow below, pale blue above, lateral lobes of lip with darker blotches. Stamens with glabrous filaments not appendaged. Disk cupular. Hook. f. Flor. Brit. Ind. IV. 276. T. edentula, Benth. in DC. Prod. X. 410; Bot. Mag. t. 4229.

Penang: Schomburgk! Malacca: Goodenough! Perak: Scortechini! Ridley 9457! 9758! Ipoh, Curtis! Nicobars: Kamorta, Kurz!—Distrib. Indo-China, Java, Timor.

3. Torenia ciliata, Sm. in Rees Cyclop. V. 36. An erect annual herb, 1 to 2 feet high, branches acutely 4-gonous, uniformly hairy upwards, below ciliate only on the angles. Leaves ovate, base wide cuneate, apex obtuse or sub-acute, margin entire or crenate; lamina membranous 1.5 to 2.5 in. long, 75 to 1.25 in. wide. sparingly hairy on both surfaces; petiole winged above 25 to 5 in. long, sometimes shorter. Flowers in distant pairs, racemed at the ends of the branches; pedicels ·3 in., in fruit ·4 in. long, thickened upwards, as long as or longer than the calvx; bracteoles 3 in. long, linear, hirsute, as long as the flowering pedicels. Calyx very narrow-tubular, 4 in., in fruit ·6 in. long, wings distinct but narrow, the margins ciliate. Corolla ·75 in. long, distinctly exserted, light blue. Benth. in DC. Prod. X. 411; Mig. Flor. Ind. Bat. II. 689; Hook. f. Flor. Brit. Ind. IV. 279. T. racemosa, Benth. Scroph. Ind. 38 (not of Griff.). T. cærulea, Mig. Flor. Ind. Bat. Suppl. 562. T. flava, Wall. Cat. 3957 (in part); Miq. Flor. Ind. Bat. Suppl. 562 (not of Ham).

Penang: Wallich! Deschamps! Perak: King's Collector! Scortechini! Ridley!—DISTRIB. Sumatra, Timor.

Very near to T. peduncularis, and really only separable by its smaller more winged calyx. It may be remarked that Kurz in Herb. Calcutta has suggested that T. ciliata

is = T. peduncularis, while in the field Scortechini has named T. peduncularis, "T. ciliata."

4. Torenia asiatica, Linn. Sp. Pl. 619. A sub-erect or spreading slightly branching herb, stems quadrangular glabrous. Leaves ovatelanceolate, base cuneate, margin finely serrate; lamina 1.5 to 2.5 in. long, 1 to 1.5 in. wide, membranous, glabrous; petiole slender, glabrous, 5 in. long. Flowers axillary, pedicels 5 in. long; bracteoles minute subulate. Calyx 5 in. long, deeply 5-partite, lobes narrow-lanceolate, with a prominent midrib. Corolla 1.5 in. long, tube narrow-cylindric at base, infundibuliform above, dark violet on both sides, upper lobe erect, lip 3-lobed spreading, all yellowish. Stamens with appendages on anterior filaments. Disk cupular waved. Wight Ic. t. 862; Benth. in DC. Prod. X. 410; Wall. Cat. 3953 A. B.; Miq. Flor. Ind. Bat. II. 689; Gaertn. Fruct. III. 29, t. 184; Lamk Ill. t. 523; Bot. Mag. t. 4249; Lem. Ill. Hortic. t. 199; Flore des Serres II. t. 157; XIII. t. 1342; Hook. f. Flor. Brit. Ind. IV. 277. Treisteria cordata, Griff. Notul. IV. 109. Rheede Hort. Malab. IX. t. 53.

PERAK: Scortechini 2212! Ridley 5307! 9756! King's Collector 1816! Curtis! Selangor: Ridley 8533!—Distrib. India, Sumatra, Java. Indo-China, China.

5. Torenia Benthamiana, Hance Ann. Sc. Nat. Ser. 4. XVIII. 226. A slender straggling herb; branches 6 to 10 in. long, decumbent and often rooting at the nodes, all parts sparingly hirsute. Leaves ovate, acute, margin serrate; lamina '5 to '75 in. long, '3 to '4 in. wide, base truncate or cuneate; petiole '25 in. long. Flowers axillary, solitary, pedicels '75 to 1.25 in. long, slender; bracteoles minute. Calyx very narrowtubular, '35 in. long, in fruit '5 in. long, keeled and channelled but not winged, hirsute with sparse spreading hairs. Corolla 1.25 in. long, distinctly exserted; tube violet purple, limb yellow. T. Bailloni Godef. in Ill. Hortic. XXV. t. 324; E. Morr. in Belg. Hortic. XXIX. t. 9, f. 2. T. flava, Bot. Mag. t. 6700 (not of Ham.).

Johore: Ridley 4160!—Distrib. Siam, Cochin-China, S. China. 6. Torena flava, Ham. in Wall. Cat. 3957. An erect annual herb, 1 to 2 feet high; branches acutely 4-gonous, uniformly hairy upwards, below ciliate only on the angles with spreading hairs. Leaves ovate or ovate-oblong, base wide-cuneate, margin entire or crenate; lamina membranous 1 to 1.5 in. long, .7 to 1 in. wide, hairy on both surfaces; petiole winged above, often very short. Flowers racemed at the ends of the branches; pedicels .2 in., in fruit .3 in. long, thickened upwards, shorter than the calyx; bracteoles .4 in. long linear, hirsute, rather longer than the fruiting pedicels. Calyx very narrow-tubular .35 in., in fruit .5 in. long, keeled and channelled but not winged, hirsute

throughout with sparse spreading hairs. Corolla ·75 in. long, distinctly exserted, bright yellow. Benth. Scroph. Ind. 38, and in DC. Prod. X. 414; Miq. Flor. Ind. Bat. II. 689; Hook. f. Flor. Brit. Ind. IV. 278. Pentsteira racemosa, Griff. Notul. IV. 120. Minulus hirsutus, Bl. Bijdr. 756.

Perak: Kunstler 904!—Distrib. Indo-China, Malaya.

7. VANDELLIA, Linn.

Herbs, glabrous or pubescent. Leaves opposite, often toothed, usually penninerved. Flowers small, axillary or racemose; bracteoles 0. Calyx campanulate, 5-toothed, or oftener deeply 5-partite, neither keeled nor winged. Corolla 2-lipped; upper lip outmost, erect, concave, emarginate or 2-fid; lower wider, spreading, 3-lobed; tube cylindric. Stamens 4, didynamous; the posterior pair inserted in corolla-tube, usually included, the anterior pair inserted on corolla-throat, with arched filaments appendaged near the base; anthers contiguous or connate in pairs under upper lip, cells divaricate. Ovary 2-celled; ovules in each cell numerous; style slender; stigma 2-lamellate. Fruit a globose or ovoid, or long cylindric, septicidal capsule; valves separating from the placentiferous septum. Seeds many, small, rugose.—Distrib. Species about 30, mostly S.E. Asiatic.

Capsule about equalling or shorter than the calyx:— Calvx very shortly 5-lobed 1. V. crustacea. Calyx divided almost to the base in 5 sepals :-Sepals longer than the capsule:-Stems erect; all parts sparsely beset with spreading hairs; leaves entire or sinuate.. 2. V. hirsuta. Stems procumbent; all parts softly villous; leaves crenate-.. 3. V. mollis. serrate Sepals not longer than the capsule:— .. 4. V. scabra. Leaves sessile 5. V. elata. Leaves petioled Capsule much longer than the calyx .. 6. V. pedunculata.

1. Vandellia crustacea, Benth. Scroph. Ind. 35. A diffusely trichotomously branched, glabrous or sparsely hairy herb; branches mostly from near the root; stems 4 to 18 in. high. Leaves ovate or lanceolate, entire or serrate; lamina 5 to 1 in. long, 25 to 5 in. wide; petioles short. Flowers axillary or sub-racemose; pedicels slender, strict, 5 to 1.5 in. long. Calyx shortly 5-lobed, in flower 1 in., in fruit 15 in. long. Corolla pale purple or white. Capsule ovate-oblong, obtuse, 12 in. long. DC. Prod. X. 413; Wight Ic. t. 863; Miq. Flor. Ind. Bat. II. 690; Hook. f. Flor. Brit. Ind. IV. 279. V. alba, Benth.

Scroph. Ind. 35. Torenia varians, Roxb. Fl. Ind. III. 96. T. lucida, Ham. in Wall. Cat. 3962. T. alba, Ham. in Wall. Cat. 3961 partly. T. flaccida, R. Br. Prod. 440. Gratiola lucida, Vahl Enum. I. 95; Roxb. Cor. Pl. II. 2, t. 202, and Flor. Ind. I. 138. G. aspera, Roth Nov. Pl. II. Peristeira paniculata, Griff. Notul. IV. 119. Capraria crustacea, Linn. Mant. 87. Morgania lucida, Spreng. Syst. II. 802. M. aspera, Spreng. Syst. II. 803. Mimulus javanicus, Bl. Bijdr. 283. Hornemannia ovata, Link & Otto Ic. Pl. Sel. I. 9, t. 3. Tittmannia ovata, Reichb. Icon. Exot. I. 27. Antirrhinum hexandrum, Forsk. Flor. Ægypt.-Arab. 43. Rumph. Herb. Amb. V. t. 170, f. 3.

PENANG: Curtis! PROV. WELLESLEY: King! PERAK: Curtis! SINGAPORE: Wallich! Schomburgk! Ridley! Hullett! Kunstler! Deschamps! Kurz! Pahang: Ridley! Malacca: Hervey!—Distrib. Cosmopolitan in the tropics.

2. Vandellia hirsuta, Benth. Scroph. Ind. 36. An erect succulent trichotomously branched herb, 4 to 6 in. high, sparsely clothed with spreading hairs. Leaves ovate or oblong, obtuse, entire or sinuate, 1 to 3 in. long; upper sessile 5 to 1 in. wide, lower petioled, 4 to 75 in. wide. Flowers minute in many-flowered racemes; pedicels slender, 15 to 2 in. long. Sepals lanceolate 08 in., in fruit 1 in. long. Corolla blueish-white. Capsule orbicular 08 in. in diam. DC. Prod. X. 414; Hook. f. Flor. Brit. Ind. IV. 280. Tittmannia ovata, Benth. in Wall. Cat. 3942. T. viscosa, Reichb. Ic. Exot. I. 26, t. 38. Hornemannia prostrata, Jacq. Ecl. t. 150.

Perak: Kunstler! Pahang: Ridley! Singapore: Ridley 2701!
—Distrib. S.E. Asia generally.

3. Vandellia mollis, Benth. Scorph. Ind. 37. A procumbent herb; stems creeping below, 6 to 18 in. long, slender or stoutish, softly villous with spreading white hairs. Leaves ovate or ovate-oblong, obtuse or sub-acute, margin crenate-serrate; both surfaces softly villous with white glistening hairs; nerves 3 to 4 pairs, oblique, ascending; length 1 to 1.5 in., width .5 to .75 in.; petiole short, .2 in. long or less. Flowers on axillary pedicels or in axillary or terminal racemes, the pedicels slender, softly villous, .25 to .75 in. long. Sepals subulate-lanceolate, softly villous with white hairs, .4 to .5 in. long. Corolla .5 to .6 in. long, tube white, upper lip brown and lower lip yellow. Stamens with filaments hirsute below, the upper pair with orbicular basal processes. Capsule oblong, .2 in. in diam. DC. Prod. X. 414; Hook. f. Flor. Brit. Ind. IV. 281. Tittmannia hirta, Benth. in Wall. Cat. 3948.

Selangor: Rawang, *Ridley* 7605!—Distrib. Eastern Himalaya, S. China, Indo-China, Sumatra, Java.

4. VANDELLIA SCABRA, Benth. Scroph. Ind. 36. A slender diffusely branched herb with rather rigid stems and branches, the latter 2 to 4 in. long; more or less clothed everywhere with long white spreading hairs. Leaves broadly ovate or ovate-cordate, or orbicular, serrate or entire, acute or obtuse; lamina 3 to 6 in. long, 3 in. wide. Flowers axillary or terminal, on slender capillary pedicels 5 to 1.5 in. long. strict, spreading in fruit, much longer than calyx. Sepals lanceolate, hirsute or glabrous, 1 in. long. Corolla 3 in. long. Capsule orbicular 1 in. long. DC. Prod. X. 414; Miq. Flor. Ind. Bat. II. 692; Griff. Notul. IV. 122, and Ic. Pl. Asiat. t. 418, f. 4; Hook. f. Flor. Brit. Ind. IV. V. monnierioides, Ham. ex Hook. f. Flor. Brit. Ind. IV. 281. Torenia hirta, Cham. & Schlecht. Linnæa II. 571. T. globosa, Ham. ex Hook. f. Flor. Brit. Ind. IV. 281. Gratiola pusilla, Willd. Sp. Pl. I. 105. Columnea minuta, Roxb. Flor. Ind. III. 98. Tittmannia pusilla, Benth. in Wall. Cat. 3945 partly. T. sulcata, Wight in Wall. Cat. 3946 partly. Bonnaya Vahlii, G. Don Gen. Syst. IV. 538. Stemodia minuta, G. Don Gen. Syst. IV. 542. Selago pusilla, Thunb. Prod. Fl. Cap. 99.

Malacca: Griffith! Prov. Wellesley: King! Negri Sembilan: Serembam, Ridley 10090! Singapore: King's Collector! Ridley!—Distrib. S.E. Asia generally, Africa, Madagascar.

5. Vandellia elata, Benth. Scroph. Ind. 36. A slender, sub-erect or diffuse, glabrous or sparingly hirsute herb; stems simple or dichotomously branched, sometimes rooting near the base; branches slender, 6 to 8 in. long or longer. Leaves ovate, coarsely crenate-toothed, acute, base cuneate entire passing into the petiole; lamina 3 to 5 in. long, 25 to 3 in. wide; petiole 15 to 25 in. Flowers axillary or terminal, on slender capillary pedicels 3 to 5 in. long, strict, somewhat spreading in fruit, much longer than calyx. Sepals narrow-lanceolate, sparingly hirsute, 09 in. long. Corolla very small, pale blue, 1 in. long. Capsule broadly oblong, 12 in. long, as long as the fruiting sepals. DC. Prod. X. 414; Hook. f. Flor. Brit. Ind. IV. 280. Tittmannia elata, Benth. in Wall. Cat. 3944.

SINGAPORE: Ridley!—DISTRIB. Tenasserim, Borneo.

6. Vandellia pedunculata, Benth. Scroph. Ind. 37. A slender glabrous herb, stem sometimes creeping at the base; branches slender, 4 to 10 in. long, prostrate. Leaves ovate, obtuse or sub-acute, obscurely crenate-toothed, 5 to 1 in. long, 4 in. wide, shortly petioled. Flowers axillary and in terminal racemes; pedicels slender 1.5 in. long, usually twice as long as leaves or longer. Sepals 5, narrowly lanceolate, free almost to the base, 25 in. long. Corolla white, or pale blue with a white spot. Capsule linear-lanceolate, 5 in. long. DC. Prod. X. 416;

Griff. Notul. IV. 120; Ic. Pl. Asiat. t. 418, f. 2; Hook. f. Flor. Brit. Ind. IV. 282. V. Roxburghii, G. Don Gen. Syst. IV. 549. V. cordifolia, G. Don. Gen. Syst. IV. 549. Gratiola cordifolia, Vahl Enum. I. 97; Don Prod. 85. Bonnaya cordifolia, Spreng. Syst. I. 42. Tittmannia grandiflora, Benth. in Wall. Cat. 3949. Torenia diffusa, Roxb. Fl. Ind. II. 95. T. varians, Griff. Notul. IV. 125 (not of Roxb.).

MALACCA: Hervey! SINGAPORE: King's Collector! Thomson! Ridley! Johore: Ridley! Perak: Wray! Scortechini! Ridley! Penang: Curtis!—Distrib. S.E. Asia generally.

8. ARTANEMA, Don.

Herbs with rather tall, erect, angled stems. Leaves opposite, entire or serrate, scabrid above as are the stem-angles. Flowers large, blue, pink or white, in terminal racemes; bracts leafy; bracteoles obsolete. Calyx 5-partite; lobes acuminate, smooth, much dilated. Corolla 2-lipped; upper lip outmost, erect, broad, emarginate; lower 3-lobed, spreading; throat not plicate; tube wide-cylindric. Stamens 4, didynamous; posterior pair short included, anterior pair long with arching filaments dilated at the base; anther-cells confluent at their tips. Ovary 2-celled; ovules in each cell numerous; style slender; stigma 2-lamellate. Fruit a globose septicidal capsule; valves 2, separating from the placentiferous septum. Seeds many, small, rugose.—Distrib. Species 3 to 4, in tropics of Eastern Hemisphere and Australia.

Leaves shortly petioled; flowers over '5 in. long . . . 1. A. sesamoides.

Leaves sessile, narrower; flowers under '5 in. long . . . 2. A. angustifolium.

1. Artanema sesamoides, Benth. Scroph. Ind. 39. A herb, 2 to 3 feet high. Leaves shortly petioled, lanceolate-acuminate, entire or serrate, 2 to 4 in. long, 75 to 1.25 in. wide. Flowers in racemes 6 to 9 in. long; pedicels 3 to 5 in. long, usually slightly exceeding the calyx. Calyx of 5 sub-equal lobes, 25 to 3 in. long. Corolla blue, 75 in. long. Capsule globose, 3 in. in diam. DC. Prod. X. 408; Wight Ic. t. 1410; Miq. Flor. Ind. Bat. II. 686; Hook. f. Flor. Brit. Ind. IV. 274. Columnea longifolia, Linn. Mant. 90. Achimanes sesamoides, Vahl Symb. II. 71. Diceros longifolius, Pers. Synops. II. 164; Bl. Bijdr. 751; Wall. Cat. 3884.

Penang: Pulo Boutong, Curtis!—Distrib. S.E. Asia generally.

2. ARTANEMA ANGUSTIFOLIUM, Benth. Scroph. Ind. 39. A herb, 2 to 3 feet high. Leaves sessile, lanceolate to linear-lanceolate, 3 to 4 in. long, 25 to 75 in. wide. Flowers in racemes 6 to 9 in. long; pedicels 15 in. long, always shorter than the calyx. Calyx of 5 sub-equal sepals, 2 in. long. Corolla pale blue and white, or pink or white, 3 to 4 in.

long. Capsule globose, 2 in. in diam. DC. Prod. X. 408; Hook f. Flor. Brit. Ind. IV. 275. Diceros angustifolius, Wall. Cat. 3885.

PENANG: J. Scott! Ridley 9412! PERAK: Scortechini! Wray 2246! 2721! King's Collector 3045! PAHANG: Ridley 2165A! SINGAPORE: Wallich 3885! SELANGOR: Sepang, Ridley 7604! JOHORE: Serom, Ridley 11134!

Very nearly related to A. sesamoides, which differs chiefly by its larger blue flowers and larger capsules.

9. Curanga, Juss.

Herbs, creeping or diffuse. Leaves opposite, ovate, crenate. Flowers in short terminal or pseudo-axillary racemes; bracts small, leafy; bracteoles 0. Calyx deeply 4-partite; upper and lower lobes very large, lateral small and narrow. Corolla 2-lipped; upper lip outmost, wide-arched, emarginate; lower longer, spreading, 3-lobed; tube short. Stamens 2, only the upper pair perfect, included, inserted on corollatube; anthers connate with divaricate cells; lower pair of stamens replaced by 2 clavate staminodes on corolla-throat. Ovary 2-celled; ovules in each cell numerous; style slender; stigma 2-lamellate. Fruit an orbicular septicidal capsule, covered by the accrescent calyxlobes, valves separating from the broad placentiferous septum. Seeds many, rugose.—Distrib. Species 2, S.E. Asiatic.

Curanga amara, Juss. Ann. Mus. IX. 320. An annual glabrous herb, with slender straggling divaricate branches, 2 to 3 feet long, rooting at the lower nodes. Leaves very bitter, ovate, crenate, obtuse or acute, base truncate rounded or cuneate, entire; blade 2 to 2.5 in. long, 1.5 to 2 in. wide; petiole very slender, 5 to .75 in. long. Flowers in short, few-flowered racemes, 2 to 2.5 in. long; pedicels .25 to .3 in., in fruit .5 in. long. Calyx with the outer sepals broadly ovate-cordate, membranous, reticulate, in flower .25 in., in fruit .5 in. long. Corolla brownish-red. Capsule small, compressed, .15 in. across. Benth. in DC. Prod. X. 408; Hook. f. Flor. Brit. Ind. IV. 275. Caranga amara, Vahl Symb. I. 100. Gratiola amara, Roxb. Flor. Ind. I. 136. Herpestis amara, Benth. Scroph. Ind. 30. Symphillium torenioides, Griff. in Madr. Journ. Nat. Sc. IV. 1, t. 11. Treisteria assamica, Griff. Notul. IV. 111. Rumph. Herb. Amboin. V. t. 170, f. 1.

PERAK: Scortechini 499B! Ridley 9742! PAHANG: Ridley 1346! SELANGOR: Ridley 8214!—DISTRIB. East Himalaya, Indo-China, Malaya, Philippines.

10. Bonnaya, Link & Otto.

Herbs, annual, glabrous. Leaves opposite, serrate or entire. Flowers solitary axillary, often passing into terminal racemes; bracteoles 0.

Calyx 5-partite; segments narrow, faintly imbricate. Corolla 2-lipped; upper lip outmost, erect, concave, 2-fid; lower larger, spreading, 3-lobed; tube cylindric. Stamens 2; upper pair alone perfect, subincluded; anthers contiguous, the cells divaricate; lower pair represented by 2 obtuse, glandular, entire staminodes on corolla-throat. Ovary 2-celled; ovules in each cell numerous; style slender; stigma 2-lamellate. Fruit a narrow, exserted, septicidal capsule; valves separating from the placentiferous septum. Seeds many, small, rugose.—Distrib. Species about 10, in tropics of Eastern Hemisphere.

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Leaves sharply, closely, deeply serrate:

Leaves sessile; flowers white or pink; stems green . 1. B. brachiata.

Leaves petioled; flowers purple; stems reddish . . . 2. B. reptans.

Leaves remotely, shallowly serrate, or sub-entire; flowers violet-purple:—
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 Leaves narrow-oblong
 ...
 3. B. veronicæfolia.

 Leaves lanceolate
 ...
 $\begin{cases} 3b. \ veronicæfolia, \\ var. \ verbenæfolia. \end{cases}$

1. Bonnaya brachiata, Link & Otto, Ic. Pl. Sel. I. 25, t. 11. An erect rather rigid herb, 4 to 10 in. high; branches diffuse divaricate, the lowest decumbent below. Leaves oblong, obtuse or acute, margins thickened and sharply closely deeply serrate with teeth mucronate; lamina ·5 to 1·5 in. long; pedicels rigid about ·25 in long; bracts small. Calyx of 5 nearly free sepals ·25 in. long. Corolla white or pink, ·25 in. long. Capsule slender, spreading or erect, ·5 to ·6 in. long. Benth. in Wall. Cat. 3855, Scroph. Ind. 32, and DC. Prod. X. 420; Miq. Flor. Ind. Bat. II. 695; Hook. f. Flor. Brit. Ind. IV. 284. B. serrata, Griff. Notul. IV. 108. B. pusilla, Benth. Scroph. Ind. 33; Wall. Cat. 3861. Gratiola serrata, Roxb. Flor. Ind. I. 139, and ed. Carey & Wall. I. 140. Rheede, Hort. Malab. IX. t. 59.

SINGAPORE: Wallich ! Pahang: Ridley !—DISTRIB. India, Indo-China, China, Malaya, Philippines.

Wallich's Singapore specimen and one of Ridley's from Pahang belong to the form distinguished by Bentham as B. pusilla; another Pahang gathering (Ridley 2163) consists of genuine B. brachiata, from which, however, B. pusilla, though separable as a marked form, is hardly separable as a variety.

2. Bonnaya reptans, Spreng. Syst. I. 41. A prostrate creeping slender herb with reddish stem, branches and leaves beneath; branches diffuse spreading often 12 in. long. Leaves in distant pairs, obovate-oblong, obtuse, margins thickened and sharply serrate with mucronate teeth; base narrow-cuneate passing into a petiole '25 in. long; blade '75 to 1'25 in. long, '5 in. wide. Flowers opposite in terminal racemes sometimes 3 to 4 in. long; pedicels rigid, '25 in. long; bracts small.

Calyx of 5 nearly equal sepals, ·3 in. long. Corolla purple, ·75 in. long. Capsule very slender, spreading, 1 in. long. Benth. in DC. Prod. X. 420; Wall. Cat. 3856; Hook. f. Flor. Brit. Ind. IV. 284. B. ruelloides, Spreng. Syst. I. 41. B. ciliata, Spreng. Syst. I. 41. Gratiola ciliata, Koenig in Vahl Symb. I. 97. G. ruelloides, Koenig in Vahl Symb. I. 99. G. reptans, Roxb. Flor. Ind. I. 140. Henckelia Roxburghiana, Dietr. Sp. Pl. I. 572.

Penang: Curtis! Perak: Scortechini! Wray! Province Wellesley: Ridley 6985! Pahang: Ridley! Singapore: Hullett! Ridley!—Distrib. E. Himalaya, India, Indo-China, Malaya, Philippines.

3. Bonnaya veronicæfolia, Spreng. Syst. I. 41. A flaccid decumbent or creeping herb, with ascending branches 4 to 8 in. long. Leaves sub-sessile or narrowed into a short petiole, oblong or oblong-lanceolate or obovate, or lanceolate, obtuse or acute, margin distantly serrate or sub-serrate or sub-entire. Flowers opposite, in terminal leafy or naked racemes sometimes up to 6 in. long usually much shorter, pedicels rather flaccid, '25 in. to '35 in. long; bracts leafy or small. Calyx of 5 nearly equal sepals '2 in. long. Corolla violet-purple, '25 to '35 in. long. Capsule slender, sub-erect or spreading, '5 to '6 in. long.

Var. typica. Leaves usually obtuse, sometimes acute, always distantly serrate, 1 to 2 in. long, 5 in. wide; racemes usually with leafy bracts; corolla 25 in. long. B. veronicæfolia, Wall. Cat. 3857; Benth. in DC. Prod. X. 421; Wight Ic. t. 1411; Miq. Flor. Ind. Bat. II. 696; Hook. f. Flor. Brit. Ind. IV. 285. B. marginata, Spreng. Syst. I. 41. B. rigida, Benth. in Wall. Cat. 3859. B. procumbens, Benth. in Wall. Cat. 3860. B. Rothii, Dietr. Sp. Pl. I. 556. B. bracteata, Griff. Notul. IV. 107. Gratiola veronicæfolia, Retz Obs. IV. 8; Roxb. Pl. Corom. II. 30, t. 154; Fl. Ind. I. 138; ed. Carey & Wall. I. 139. G. marginata, Colsm. in Vahl Enum. I. 98. G. racemosa, Roth Nov. Sp. 9.

Penang: Balli Pulo, George Town, &c. Deschamps! Singapore: King's Collector! Pahang: Ridley! Malacca: Hervey! Selangor: Ridley! Johore: Serom, Ridley!—Distrib. Throughout S.E. Asia.

Var. verbenæfolia, Hook. f. Flor. Brit. Ind. IV. 285. Leaves acute or sub-acute, distantly shallowly serrate or sub-entire, 1 to 1.5 in. long, 2 to 25 in. wide; racemes usually marked with minute bracts; corolla 35 in. long. B. verbenæfolia, Benth. in DC. Prod. X. 421; Wall. Cat. 3858; Wight, Ic. t. 1412. B. Roxburghiana, Dietr. Sp. Pl. I. 559. B. cyanea, Griff. Notul. IV. 107. Gratiola verbenæfolia, Colsm. in Vahl Enum. I. 96. G. ciliata, Colsm. in Vahl Enum. I. 97. G. racemosa, Roxb. Fl. Ind. I. 138, and ed. Carey & Wall. I. 139. G.

Roxburghiana, Roem. & Schult. Syst. I. 123. Tittmannia Colsmanni, Benth. in Wall. Cat. 3950. Torenia gracilis, Benth. in Wall. Cat. 3952.

MALACCA: Hervey! Penang: Curtis! Perak: Ridley! Scortechini!—Distrib. Throughout S.E. Asia.

11. SCOPARIA, Linn.

Undershrubs or herbs with twiggy branches. Leaves opposite or whorled, glabrous or pubescent, entire or toothed, punctate. Flowers small, white or yellow, axillary, solitary or 2-nate; bracteoles 0. Calyx small, 4-5-partite; lobes imbricate. Corolla small, rotate, 4-lobed; lobes imbricate, sub-equal, obtuse; throat densely bearded; tube very short. Stamens 4, sub-equal; filaments filiform; anthers sub-sagittate, cells diverging or parallel, discrete. Ovary 2-celled; ovules in each cell numerous; style sub-clavate; stigma truncate or emarginate. Fruit a small, ovoid or globose, septicidal capsule; valves membranous, with inflexed margins, separating from the placentiferous septum. Seeds many, small, obovoid, angular, scrobiculate.—Distrib. Species about 6, all American.

Scoparia dulcis, Linn. Sp. Pl. 116. A glabrous much-branched erect or ascending leafy undershrub with a strong perennial woody rootstock; stems 6 in. to 3 ft. high. Leaves opposite or ternate, lanceolate or elliptic-lanceolate, 1 to 2 in. long, 5 to 1.5 in. wide, serrate, acute or obtuse, narrowed to a short petiole. Flowers many minute in terminal panicles; pedicles slender, strict, 25 to 4 in. long. Sepals 4, oblong. Corolla white, 12 in. in diam., tube very short. Stamens sub-equal. Capsule globose, 15 in. in diam. Voigt Hort. Suburb. Calcutt. 507; Benth. in DC. Prod. X. 431; Gaertn. Fruct. I. 251, t. 53, f. 10; Miq. Flor. Ind. Bat. II. 699; Hook. f. Flor. Brit. Ind. IV. 289.

Penang: Kampai, Batu Gaja, &c., King! Deschamps! Curtis! Selangor: Ridley! Perak: Scortechini! Singapore: Hullett! Kurz! King's Collector! Deschamps!—Distrib. Everywhere in the tropics; originally American.

12. STRIGA, Lour.

Herbs, semiparasitic on roots, usually scabrid, discoloured when dry. Leaves opposite below, alternate above, linear, entire or rarely toothed sometimes reduced to scales. Flowers axillary, or the upper in bracteate spikes; bracteoles usually 2. Calyx 5-toothed or 5-fid, 5- or 10- or 15-ribbed, tubular. Corolla 2-lipped; upper lip inner in bud,

usually shortly 2-fid or emarginate, lower 3-lobed; limb spreading; tube slender abruptly incurved at or above the middle. Stamens 4, didynamous, included; anthers 1-celled, vertical, dorsifixed, bases obtuse; connective sometimes mucronate. Ovary 2-celled; ovules in each cell numerous; style thickened upwards; stigma entire. Fruit an oblong or globose loculicidal capsule; valves entire, firm, septiferous, separating from the placentas. Seeds many, small, ovoid or oblong, reticulated.—Distrib. Species 20, in the tropics of the Eastern Hemisphere.

STRIGA LUTEA, Lour. Flor. Cochin-Chin. 22. A slender, erect. simple or fastigiately branched herb, 6 to 18 in. high; leaves and stems scabrid or villous. Leaves linear, 5 to 1.5 in. long, 12 in. wide. Flowers in elongated, usually interrupted spikes, 2 to 6 in. long; bracts usually exceeding the calyx, linear-lanceolate, scabrid. Calyx 10ribbed, 25 in. long, teeth 5, sub-equal. Corolla white or yellow or pink or purple, 5 in. long, glabrous, incurved; upper lip emarginate reflexed; lower lip 3-lobed spreading. Capsule oblong, grooved, shorter than the calyx. Benth, in Hook. Comp. Bot. Mag. I. 363; Hook. f. Flor. Brit. Ind. IV. 299. S. hirsuta, Benth. in DC. Prod. X. 502; Dalz. & Gibs. Bomb. Flor. 181. S. coccinea, Benth. in DC. Prod. X. 364. S. phanicea, Benth. in DC. Prod. X. 364. Buchnera asiatica, Linn. Sp. Pl. 630 partly; Roxb. Fl. Ind. III. 31; Benth. Scroph. Ind. 40. B. coccinea, Benth. Scroph. Ind. 40, Wall. Cat. 3870. B. phænicea, Benth. Scroph. Ind. 40; Wall. Cat. 3874. Campuleia coccinea, Hook. Flor. Exot. t. 203. Rheede Hort. Malab. IX. t. 66.

Penang: Curtis 1840! Pahang: Ridley! Singapore: Ridley 139; Kurz! Andamans: Port Blair, King! Prain!—Distrib. Throughout S.E. Asia, Arabia, Madagascar, Africa.

13. CENTRANTHERA, R. Br.

Herbs, semiparasitic, annual, rigid, scabrous. Leaves opposite throughout, or opposite below alternate above, oblong or linear, obtuse, entire or toothed. Flowers axillary, or in bracteate spikes or racemes; bracteoles 2. Calyx compressed, spathaceous, split on one side, acuminate entire, or shortly 3-5-lobed on the other. Corolla 5-lobed; lobes sub-equal, spreading, the 2 upper inmost in bud; limb oblique; tube long, incurved. Stamens 4, didynamous, included; anthers contiguous in pairs; cells transverse, spurred or mucronate at base, one cell often sterile. Ovary 2-celled; ovules in each cell numerous; style simple, dilated above; stigma acute, linguiform. Fruit an ovoid or sub-globose loculicidal capsule; valves entire, carrying away the

placentas. Seeds many, small, oblong-cuneate; testa lax, reticulate.— DISTRIB. Species 4-5, E. Asiatic and Australian.

Centranthera humifusa, Wall. Cat. 3883. A dwarf herb, diffusely branching from the base, hispid or glabrous, branches 3 to 6 in. long. Leaves linear, entire, 5 to 75 in. long. Flowers in terminal spikes, sub-sessile; braces small. Calyx ovoid, sub-acute, 15 in. long. Corolla yellow, 3 to 5 in. long, incurved. Capsule sub-globose, 15 in. wide. Benth. in DC. Prod. X. 525; Hook. f. Flor. Brit. Ind. IV. 301. Razumovia tranquebarica, Spreng. Syst. II. 812. Torenia lepidota, Roth Nov. Sp. 281.

Malacca: Griffith! SINGAPORE: Kurz!—Distrib. China, Indo-China, India, Malaya.

Order LXXXIV. OROBANCHACEÆ.

By D. PRAIN.

Root-parasites, annual, white or reddish. Stem simple or branched, stout or slender, clothed with leaf-scales. Leaves proper 0. Flowers solitary or in spikes or racemes, irregular. Sepals 4–5, usually connate in a variously toothed or spathaceous calyx, rarely free. Corolla hypogynous, 2-lipped; upper lip vaulted, lower lip 3-lobed; throat often with 2 villous folds; tube curved. Stamens 4, didynamous, inserted on corolla-tube; anthers 1–2-celled; cells spurred at the base, dehiscence by slits or basal pores; one cell sometimes imperfect. Disk unilateral or glandular or obsolete. Ovary of 2 connate carpels, usually 1-celled; style long, tip curved; stigma 2-lobed, sub-capitate; ovules usually numerous on generally 2 pairs of free or confluent parietal placentas which sometimes meet in the axis of the ovary. Capsule 1-celled, 2-valved; seeds usually many, minute, with a pitted or tubercled, rarely reticulate and lax testa; albumen fleshy; embryo ovoid, entire or 2-fid.

Æginetia, Linn.

Leafless parasitic herbs with simple or branched naked or scaly stems or scapes. Flowers few, large, solitary or corymbose; bracteoles 0. Calyx spathaceous, split in front almost to the base. Corolla incurved, campanulate-tubular; limb obscurely 2-lipped, lobes somewhat spreading, the two upper lobes (upper-lip) connate. Stamens included; anthers with one perfect cell adnate to filament and not spurred; the other cell absent in upper anthers, empty clavate and deflexed in the lower. Ovary 1-celled; placentas large, 2-lobed or multifid, filling the chamber, ovuliferous throughout; style slender;

stigma large peltate. Capsule partially 2-valved. Seeds many, small, crowded; testa pitted.—Distrib. Species 3, S.E. Asiatic.

ÆGINETIA PEDUNCULATA, Wall. Pl. As. Rar. III. 13, t. 219. A leafless herb, 3 to 6 in. high; stems red or yellow, parasitic on roots, buried, emitting several short stout fleshy several-flowered scapes with alternate peduncled flowers; peduncles 1 to 4 in. long, stout, bracteate at base; bracts 25 to 35 in., ovate, obtuse. Calyx 1.5 to 2 in. long. fleshy, dull-pink at length yellowish-white, with a mucilaginous pad surrounding base of corolla, tip acute or obtuse. Corolla-tube yellow or white, the lobes violet or claret-coloured, crenate and erose. Stamens didynamous, anthers of lower pair with a large dorsal fleshy decurved horn. Ovary 1-celled, placentas 2, each of 2 plates; stigma cordate-peltate. Capsule ovoid. Seeds brown. Reut. in DC. Prod. XI. 43; Wight Ill. t. 158B, f. 6; Ic. t. 1421; Hook. f. Flor. Brit. Ind. IV. 320. Æ. abbreviata, Ham. in Wall. Cat. 3965; Benth. Scroph. Ind. 95; Reut. in DC. Prod. XI. 43. Æ. acaulis, Walp. Rep. III. 481; Reut. in DC. Prod. XI. 43. Orobanche pedunculata, Roxb. Hort. Beng. 45; Fl. Ind. iii. 29. O. acaulis, Roxb. Cor. Pl. III. 89, t. 292, and Fl. Ind. III. 29.

PERAK: Batang Padang Valley, 2,000 feet; Wray 1456! 1457!—DISTRIB. India, Indo-China, Java, Sumatra.

One of Wray's specimens is attached to the rhizome of a Kampferia.

CHRISTISONIA, Gardn.

Low fleshy scaly parasitic herbs, with yellow or white or rose-purple flowers; stems simple or tufted from a short or long rootstock; scales alternate, obtuse or acute. Flowers densely or laxly corymbose; bracteoles 2 or 0. Calyx tubular, terete or angular, 2-5-lobed or -toothed. Corolla-tube long, inflated or funnel-shaped, slightly or distinctly curved, 5-lobed, obscurely to distinctly 2-lipped, the two upper lobes (in our species outer in bud) sub-erect, the lower spreading. Stamens 4, included or sub-exserted; filaments stout; anthers with one perfect cell and one imperfect, one pair sometimes spurred or appendaged; rarely with both cells perfect. Disk 0. Ovary 1-celled with two 2-partite placentas, or 2-celled from the placentas meeting in the axis; style long, tip incurved, stigma large, 2-lobed, the upper lobe very small or obsolete, the lower (sometimes the only one present) very large orbicular or clavate; ovules numerous. Capsule ovoid or subglobose, loculicidal. Seeds minute, crowded, many perfect with striate testa, others imperfect with lax testa; embryo half as long as the albumen.—DISTRIB. Species 12, tropical Asiatic.

CHRISTISONIA SCORTECHINII, Prain in Journ. As. Soc. Beng. LXXIII. 2. 205. Stem short hypogeal, covered with linear scales. Flowers 3 to 8, crowded in a dense corymb; some shortly peduncled, others sessile, each with an oblong cucullate basal bract .75 in. long; all parts loaded with sticky mucilage. Calyx spathaceous, rupturing into usually 2 (sometimes, fide Scortechini, into 2 to 4) lobes, in the fully opened flower with tube 1 in., lobes 25 in. long. Corolla-tube white, with a yellow line inside in front, 2 in. long, infundibuliform and curved above, the lower part narrow-cylindric 1 in. long; limb 2-labiate, upper lip outmost in bud, erect, 2-lobed, lower lip 3-lobed. spreading. Stamens didynamous; anthers all conniving; filaments glabrous, inserted below middle of corolla-tube, 1-celled, adnate to the enlarged filament, upper pair without, lower with an empty oblong pointed cell. Disk 0. Ovary glabrous, 1-celled, placentas 2. 2-fid. uniformly covered with ovules; style glabrous downwards; stigma peltate, flat, 2 in. in diam.

Perak: Scortechini, 2121!

Order LXXXV. LENTIBULARIACEÆ.

[By D. Prain.]

Marsh or aquatic herbs, or occasionally growing on wet rocks. Leaves radical, rosulate or when submerged capillary-multifid, sometimes obsolete. Flowers irregular, hermaphrodite, on 1-many-flowered simple or branched scapes; bracts small, sometimes 0; bracteoles under calyx 2 or 0. Calyx inferior, 2-5-lobed. Corolla 2-lipped and spurred; upper lip usually the smaller, entire or emarginate; lower lip 3-6-lobed. Stamens 2, adnate to the base of the corolla, alternate with the lobes of the lower lip; filaments widely curving, anther-cells ovate, transversely confluent; dehiscence longitudinal. Carpels 2, connate in a superior, globose, 1-celled ovary; ovules very many, on a free basal placenta; style short; stigma unequally 2-lobed. Fruit a globose 2-4-valved, or irregularly rupturing capsule. Seeds very many, minute; albumen 0.—Distrib. Species nearly 200, in all parts of the world.

UTRICULARIA, Linn.

Herbs, often very small, submerged or floating, or growing on wet rocks. Leaves in submerged or floating species multifid, with capillary segments, in erect or twining species entire, often disappearing at time of flowering, frequently with minute bladders. Flowers on simple or branched scapes, racemes few- or many-flowered; bracts and 2 bracteoles

distinct. Calyx 2-partite; lobes entire or nearly so, often accrescent. Corolla 2-lipped; upper lip entire or emarginate; lower larger 3-6-lobed; tube with a straight or curved spur. Stamens 2, adnate to base of corolla, alternate with lobes of lower lip; filaments broad; anthers ovate, 2-celled, or by confluence almost 1-celled. Carpels connate in a globose 1-celled ovary; ovules many, on a central placenta; style short; stigma unequally 2-lobed. Capsule globose, regularly 2-4-valved, or opening irregularly. Seeds many, small; albumen 0.—Distrib. Species 150, in most countries.

Leaves many, submerged, scattered, divided into numerous capillary segments mostly interspersed with bladders; calyx-lobes equal or nearly so; pedicels not winged :-Flowers yellow to pale-yellow or nearly white:-Peduncles very slender; flowers usually two, never more than three, always under .25 in. across; pedicels in fruit erect: sometimes the capillary leaves absent .. 1. U. exoleta. Peduncles stout; flowers usually more than three, and always from '35 to '5 in. across; pedicels reflexed in fruit and thickened under the calyx .. 2. U. flexuosa. Flowers blue or red or pink; pedicels erect in fruit .. 3. U. punctata. Leaves few, rosulate at base of stem :-Leaves linear or linear-spathulate, usually absent at time of flowering; calvx-lobes equal or nearly so; seeds not glochidiate:-Scales of the scape and bracts attached by their bases :-Stems erect :-Flowers yellow; pedicels in fruit distinctly winged .. 4. U. bifida. Flowers pink, purple, or violet, rarely white with lilac markings :-Pedicels in fruit slightly winged; sometimes a few leaves still present at time of flowering; stems 8 to 5. U. affinis VAR. Griffithii. 12 in. high, stoutish Pedicels in fruit capillary, short, wingless; leaves 0 at time of flowering; stems 2 to 3 in. high, very slender .. 6. U. minutissima. Stems twining; flowers yellow:-Stems slender, leaves absent at time of flowering; lower lip less than 25 in. wide 7. U. Wallichiana. Stems stouter; leaves forming matted masses; lower lip over 3 in. wide 8. U. involvens. Scales of the scape and bracts produced downward below point of attachment :-Flowers on distinct pedicels as long as the fruiting calyx or longer; capsule longer than fruiting calyx-lobes; flowers 9. U. verticillata. pink (Ridley) • • . Flowers almost or quite sessile; capsule hidden by the fruiting calvx-lobes:-Flowers few, scattered on the very slender scapes; 10. U. racemosa .. VAR. filicaulis. corolla white

1. UTRICULARIA EXOLETA, R. Br. Prod. 430. A water-weed, sometimes floating with very slender stems and submerged divided capillary leaves, the segments interspersed with bladders; sometimes growing in mud with capillary leaves absent and with tufted setaceous leaves. Scapes slender, naked, or with one or two scale-like bracts, 2 to 4 in. long, usually 2-flowered, occasionally 3-flowered, sometimes 1-flowered. then often with an abortive axis or flower-bud opposite the bract: pedicels slender, erect, the lowest ultimately 4 in. long; bracts very small, obtuse, basifixed; bracteoles 0. Calyx 2-lobed; lobes slightly unequal, ovate-obtuse or sub-orbicular, in fruit adpressed to the capsule. ·1 in, long. Corolla yellow, ·2 in, across; spur cylindric-conical, twice as long as lower calvx-lobe and slightly exceeding lower lip of corolla. which has an entire margin and embraces the base of the spur. Capsule almost globose, 15 in. in diam. Seeds sub-trapezoid-discoid, margin thin, spreading, minutely crenulate. A. DC. Prod. VIII. 7: Hook. f. Flor. Brit. Ind. IV. 329; Ridl. Journ. Bot. XXXIII. 10. U. diantha. Roem & Schult. Syst. Veg. I. 169; Wight Ic. t. 1569; Oliv. Journ. Linn. Soc. III. 175. U. diflora, Roxb. Hort. Beng. 4. U. biflora, Roxb. Fl. Ind. I. 143, nec alior. U. Roxburghii, Spreng. Syst. I. 52. U. elegans, Wall. Cat. 1502. U. pterosperma, Edgew. Proc. Linn. Soc. I. 352.

Perak: Sunga Ryah, King's Collector 891! 4383! Ridley! SINGA-PORE: Ridley. Prov. Wellesley: Ridley! Johore: Parit Lombong, Ridley! Pahang: Kwala Pahang, Ridley! NICOBARS: Kamorta, Kurz!—Distrib. S.E. Asia, N. Australia.

2. Utricularia flexuosa, Vahl Enum. I. 198. A floating waterweed with submerged divided capillary leaves, the segments interspersed with bladders; occasionally with narrow, oblong, floating vesicles 1 to 3 in. long, beset with capillary leaves, scattered or sometimes whorled near or occasionally above the base of the scapes. Scapes 3 to 10 in. long, 3–12-flowered; pedicels stout, reflexed, and slightly thickened under the calyx in fruit, ultimately 3 to 5 in. long; bracts ovate-acute, basifixed; bracteoles 0. Calyx 2-lobed, lobes sub-equal, ovate-sub-acute, in fruit patent, 25 in. long. Corolla yellow, rarely white, 3 to 5 in. across; spur somewhat longer than lower calyx-lobe, and about as long as lower lip of corolla, stoutish, bluntish, straight or somewhat curved. Capsule compressed, sub-globose, 25 in.

long. Seeds thickly discoid, margin thin, incurved towards the concave face, usually 5-6-angled. Bl. Bijdr. 739; A. DC. Prod. VIII. 24; Oliv. Journ. Linn. Soc. III. 175; Hook. f. Flor. Brit. Ind. IV. 329; Ridl. Journ. Bot. XXXIII. 10. U. australis, R. Br. Prod. 430; A. DC. Prod. VIII. 6. U. fasciculata, Roxb. Fl. Ind. I. 143; Wall. Cat. 1499; A. DC. Prod. VIII. 7; Wight Ic. t. 1568; Miq. Flor. Ind. Bat. Suppl. 246. U. confervifolia, Don Prod. 84; A. DC. Prod. VIII. 8. U. inæqualis, Benj. Linnæa XX. 304. U. Blumei, Miq. Fl. Ind. Bat. II. 994. U. extensa, Hance in Walp. Ann. III. 3.

MALACCA: Ridley! PAHANG: Kwala Pahang, Ridley! PERAK: Scortechini! Durian S. Batang, King's Collector 1036! SINGAPORE: Ridley 5642, 9844! Kedah: Langkawi, Curtis!—Distrib. S.E. Asia, N. Australia.

Forma gracilis, Oliv. Journ. Linn. Soc. III. 175 (= U. inaqualis, Benj.) more slender in all its parts and with smaller paler yellow flowers.

SINGAPORE: King's Collector 1165! Hullett 36! 385! MADACCA: Cunning! Goodenough 1407! Ridley! Prov. Wellesley: Ridley!

The very similar and nearly allied *U. stellaris*, distinguished most easily by the presence of a cluster of oblong vesicles about the *middle* of the peduncle, has not been reported so far from the Malayan Peninsula.

King's Collector's field-note on the slender form, which the writer agrees with Oliver in considering no more than a form of U. flexuosa, is as follows: "Herbaceous plant, in clear pools of fresh water; colour bright green. Flowers pale yellow. I sent a similar one from Durian S. Batang, but I don't think the same." His field-note on genuine U. flexuosa is as follows: "Growing in muddy pools of water; colour a dark reddish-brown, tinged with green; flower bright yellow."

In his interesting paper on the *Utricularias* of the Malay Peninsula (*Journ. Bot.* for 1895, pp. 10, 11) Mr. Ridley gives as localities for *U. flexuosa* Pahang and Kedah, Langkawi, but does not differentiate the two forms. The leaves, he remarks, are used in medicine by the Malays, who call it Lumut Ekor Kuching (Cat's Tail Moss) or Lumut Ekor Kuning (Yellow Tail Moss).

3. Utricularia punctata, Wall. Cat. 2121. A floating waterweed, with submerged divided capillary leaves, the segments interspersed with bladders, often with narrow, oblong, floating vesicles 1 to 3 in. long, beset with capillary leaves, near the base of the scapes. Scapes 4 to 12 in., usually many-flowered; pedicels slender, ascending or sub-erect in fruit, ultimately 5 to 6 in. long; bracts ovate, more or less acute, slightly produced beyond base; bracteoles 0. Calya 2-lobed, lobes sub-equal, ovate-rotund, obtuse, 1 in. long. Corolla blue, reddishpurple or pink, 25 in. across, spur somewhat longer than lower calyx-lobe, shorter than lower lip of corolla, thick, sub-cylindric, obtuse. Capsule thin, ovate-oblong, obtuse, 2 in. long. Seeds discoid, peltate,

margin winged throughout, wing deeply, sharply toothed. A. DC. Prod. VIII. 5; Wight Ic. t. 1570; Oliv. in Journ. Linn. Soc. III. 175; Hook. f. Flor. Brit. Ind. IV. 329; Ridl. Journ. Bot. XXXIII. 10.

Pahang: Chenei Lake, Fox !—DISTRIB. Borneo, Tenasserim.

4. UTRICULARIA BIFIDA, Linn. Sp. Pl. 26. A slender erect weed of wet places; leaves radical, linear-spathulate, disappearing before flowering, 3 to 5 in. long; roots fibrous, sometimes with a few bladders. Scapes 2 to 10 in. long, 2-many-flowered, beset with a few basifixed ovate-acute scales or empty bracts; pedicels short, in flower 12 in., in fruit 2 in. long, recurved and distinctly winged from the decurrent calvx, with ovate-acute basal bracts. Calyx 2-lobed; lobes sub-equal, ovate-obtuse, 25 in. long. Corolla yellow, 25 in. wide; spur longer than the lower calyx-lobe and as long as the lower lip of the corolla, slightly falcate. Capsule ovate, 2 in. long, hidden by the calyx. Seeds obovoid, testa lax, scrobiculate, obliquely striate. A. DC. Prod. VIII. 21; Oliv. Journ. Linn. Soc. III. 182; Hook. f. Flor. Brit. Ind. IV. 332; Ridl. Journ. Bot. XXXIII. 10. U. biflora, Wall. Cat. 1498 (not of Roxb.). U. diantha, A. DC. Prod. VIII. 21 (not of Roem. & Schult.). U. Wallichiana, Benj. Bot. Zeit, 1845 214 (not of Wight). U. brevicaulis, Benj. Linnæa XX. 303.

Penang: Curtis! Selangor: Ridley! Perak: Larut, Scortechini! Selama, growing among grass in swampy places, Wray 4263! Ridley! Prov. Wellesley: in wet and swampy places, King's Collector 1616! Singapore: in wet, sandy hollows, Kurz 2973! Ridley! Malacca: Griffith! Hervey! Ridley! Pahang: Kwala Pahang, Ridley 1481! Kedah: Curtis.—Distrib. Throughout E. and S.E. Asia.

Mr. Ridley has seen specimens of this species from the Dindings and from Penang, also from Kedah, Langkawi. He finds two rather distinct forms, a small-flowered, plain yellow one and a form with larger flowers over '25 in. long with a darker orange centre; this latter Ridley found in Pahang growing with the common form.

5. Utricularia affinis, Wight; var. Griffithii, Oliv. Journ. Linn. Soc. III. 179. A slender erect weed of wet places. Leaves radical, linear or linear-spathulate, obtuse, very often persisting during flowering, ·5 to ·7 in. long; roots fibrous, sometimes with a few bladders. Scapes 5 to 12 in. long, usually many-flowered; beset with a few basified ovate-acute scales or empty bracts; pedicels short, ·1 in. long in flower, in fruit ·15 in. long and slightly winged by the decurrent calyx, erect or ascending, never recurved and rarely patent, with ovate-acute basal bracts. Calyx 2-lobed; lobes sub-equal, ovate or sub-orbicular, acute or sub-cuspidate, ·25 in. long. Corolla blue with whitish lines, ·25 in. wide; spur slightly longer than the lower calyx-

lobe and the lower lip of the corolla. Capsule ovate, 2 in. long, hidden by the calyx. Seeds obovoid, reticulate, cells of the testa sub-hexagonal. U. Griffithii, Wight Ic. t. 1576; Ridl. Journ. Bot. XXXIII. 10. U. carulea, Benth. Fl. Hongk. 256 (not of Linn.).

MALACCA: Griffith! Ridley! PERAK: Scortechini! SINGAPORE: Hullett! Ridley!—DISTRIB. China, Burma, Tenasserim, Borneo.

There are only shrivelled leaves on Ridley's and Wight's specimens, which are mostly in fruit; Scortechini's specimens, which are in flower, have numerous radical grassy linear-spathulate obtuse leaves, 5 in. long or rather longer. Mr. Ridley, in all probability rightly, considers that this is entitled to specific rank apart from U. affinis.

6. Utricularia minutissima, Vahl Enum. I. 204. A very small erect weed of wet places; leaves 0 at time of flowering and not seen; roots fibrous, bladders not seen. Scapes capillary, rigid, branched, 2 to 3 in. long, quite glabrous, or with a few rigid scattered black hairs; racemes 2–5-flowered, beset with a few basifixed ovate-acute empty bracts or scales; pedicels very short, in fruit only '05 in. long, occasionally like the upper calyx-lobe with a few straight black hairs, sub-patent, with small lanceolate basifixed bracts and bracteoles, less than half as long as their pedicels. Calyx 2-lobed, lobes sub-equal wide-oblong, obtuse, in fruit '1 in. long. Corolla mauve, '15 in. wide; spur wide-conic-cylindric, thrice as long as lower calyx-lobe and twice as long as lower lip of corolla. Capsule oblong, '07 in. long, covered by the calyx. Seeds minute, ovoid, obscurely scrobiculate. A. DC. Prod. VIII. 16; Oliv. Journ. Linn. Soc. III. 190; Hook. f. Flor. Brit. Ind. IV. 334; Ridl. Journ. Bot. XXXIII. 11.

PERAK: Larut, Scortechini 1501! Pahang: Kwala Pahang, Ridley 1474c in part! Malacca: Koenig; on Mount Ophir, Ridley.

This small plant, collected by Scortechini with no note of colour, and stated by Ridley to have mauve flowers, is here identified with *U. minutissima*, Vahl, from description only. The branched capillary stems render it very like and very liable to be mistaken for small specimens of *U. verticillata*, which has, however, longer pedicels and bracts produced below their point of insertion. The presence of hairs on the stems, pedicels, and sometimes the calyx, at once suggests a reference to *U. hirta*, which is undoubtedly its nearest affinity. The scape, however, appears never to branch in *U. hirta*; the flowers in that species are larger and fewer; the pubescence, too, when present in *U. minutissima*, which is not always the case, is very different, consisting of rigid patent black bristly hairs, whereas in *U. hirta* the hairs are soft and grey or tawny. The seeds of the two species are very similar, but those of *U. minutissima* are smaller and yet have fewer- and larger-meshed sub-hexagonal reticulations.

7. Utricularia Wallichiana, Wight Ic. t. 1572, fig. 1. A very slender herb growing in wettish fields and damp grassy places; stems

twining, thin, 6 to 8 in. long. Leaves linear-spathulate, absent at time of flowering; bladders not seen. Flowers small, racemose or subspicate at ends of stems; pedicels sometimes absent, sometimes up to '25 in. long; bracts lanceolate, acute, basifixed. Calyx-lobes ovate, acute, '15 in. long, in fruit '2 in. long. Corolla yellow; upper lip obovate, lower rounded, '2 in. wide; spur straight or slightly incurved, '2 in. long. Capsule sub-globose, enclosed within calyx-lobes, upraised on the sub-erect fruiting pedicels. Seeds ellipsoid, scrobiculate but not glochidiate or papillose. Oliv. in Journ. Linn. Soc. III. 182; Clarke in Hook. f. Flor. Brit. Ind. IV. 332; Ridl. Journ. Bot. XXXIII. 11. U. scandens, Benj. in Linnæa XX. 309 chiefly. U. macrolepis, Wight Ic. t. 1580, fig. 2. fide Clarke. U. capillacea, Thw. Enum. 171 (not of Oliv.).

MALACCA: Mount Ophir, at 4,000 feet elevation, growing among grasses, *Ridley!*—DISTRIB. Throughout India.

8. Utricularia involvens, Ridl. Journ. Bot. XXXIII. 11. A tufted herb forming mats of leaves on rocks in streams; stems twining, fairly stout, 12 in. long. Leaves thinly membranous, spathulate-linear, obtuse, 1 in. long or longer, 1 in. across. Flowers large, racemed at ends of stems; pedicels 5 to 75 in. long; bracts lanceolate, acute, basifixed, 1 in. long. Calyx-lobes oblong-ovate, 25 in. long. Corolla lemon-yellow; upper lip obovate, lower rounded, 2-lobed, 35 in. wide; spur straight, pendulous, acute or acuminate, 25 in. long. Capsule unknown.

Kedah Peak (Gunong Jerai), at 3,000 feet elevation, in streams and wet places, Ridley!

A very fine and remarkably distinct species.

9. Utricularia verticillata, Benj. Linnæa XX. 312. A slender erect weed of wet places. Leaves 0 at time of flowering and not seen; roots fibrous, bladders not seen. Scapes slender, sometimes capillary, rigid, branched, 3 to 10 in. long, glabrous; beset with a few ovate scales or empty bracts, acute at both ends and produced downwards beyond point of insertion; pedicels capillary, puberulous, 2 in. long in flower, in fruit 25 in. long; bracts and bracteoles produced below point of insertion. Calyx 2-lobed, lobes sub-equal, sub-orbicular, in fruit 1 in. long. Corolla (? yellow) 15 in. wide; spur wide-cylindric, slightly exceeding lower lip of corolla. Capsule globose, 15 in. in diam., projecting beyond the closely adpressed calyx-lobes. Seeds minute, with sub-hexagonal reticulations. Oliv. Journ. Linn. Soc. III. 184; Hook. f. Flor. Brit. Ind. IV. 333; Ridl. Journ. Bot. XXXIII. 10. U. bifida, Wight Ic. t. 1584, f. 2 (not of Linn.).

KEDAH: Langkawi, Curtis! Malacca: Griffith! Pahang: Kwala Pahang, Ridley 1481 in part!

Oliver has suggested that the colour of the corolla in this species is yellow, and the fact that Ridley has mixed it (under his n. 1481) with *U. bifida* might be taken as corroborating Oliver's opinion. Ridley, in his paper on the Malay Peninsula *Utricularias*, says, however, that the flowers are pink.

10. UTRICULARIA RACEMOSA, Wall.; var. filicaulis, Clarke in Flor. Brit. Ind. IV. 333. A slender herb of damp places. Leaves linear or spathulate, absent at time of flowering; roots fibrous, bladders not seen. Scapes erect, very slender, 2 to 4 in. high, rarely higher, rather rigid, occasionally with a few branches, glabrous; beset with a few ovate scales or empty bracts acute at both ends and produced below point of attachment. Flowers few scattered sessile; bracts and bracteoles ovate-lanceolate, attached above the base. Calyx 2-lobed, lobes sub-equal, the upper slightly the longer, obtuse, 1 in. long in flower, in fruit 12 in. long. Corolla white, from 15 to 2 in. across; spur straight, conical or sub-cylindric, longer than lower lip of corolla. Capsule globose, 1 in. long, hidden by the adpressed calyx-lobes. Seeds minute, obscurely scrobiculate. U. filicaulis, Wall. Cat. 1501; A. DC. Prod. VIII. 21; Oliv. in Journ. Linn. Soc. III. 186. U. nivea, Vahl Enum. I. 203; Wall. in Roxb. Fl. Ind. ed. Carey & Wall. I. 144; Wight Ic. t. 1582. U. setacea, Wall. Cat. 6398 partly. U. campestris, Miq. in Pl. Hohenack. n. 596. U. racemosa, Ridl. Journ. Bot. XXXIII. 10 (hardly of Wall.).

Malacca: Ayer Keroh, *Ridley* 10706! Pahang: Kwala Pahang, *Ridley* 1474a! Singapore: Changi, *Ridley*. Penang: Waterfall, *Curtis*, fide *Ridley*.—Distrib. Indo-China, India.

This plant probably quite deserves to be considered a species distinct from *U. racemosa*, though except in its usually smaller size and its white instead of blue flowers, there is little to distinguish the two.

11. Utricularia ophirensis, Ridl. Journ. Bot. XXXIII. 10. A herb: Leaves linear-spathulate or spathulate, absent at time of flowering; roots fibrous; bladders not seen. Scapes erect 8 to 16 in. high, slender, rigid, often branching, glabrous; beset with a few ovate scales or empty bracts acute at both ends and produced below point of attachment. Flowers sessile, clustered at the ends of the stems and branches in globose or oblong heads 3 to 5 in. long, 25 in. across; bracts and bracteoles ovate-lanceolate, attached above the base. Calyx 2-lobed, lobes sub-equal, the upper slightly the larger, obtuse, 1 in. long in flower, in fruit 12 in. long. Corolla 25 in. across, variable in colour, the lower lip rose-coloured (Ridley), both lips blueish with a yellow

hairy gland in the centre of the lower lip inside (Scortechini), or white (Curtis, Kunstler), or white with a yellow tinge (Kunstler); spur straight with an incurved tip (Ridley), or curved ascending (Scortechini), 2 in long. Capsule globose or depressed-globose, hidden by the adpressed calyx-lobes, 1 in long. Seeds oblong or obovate, brown, the broad end glochidiate.

Perak: Larut, King's Collector 1931! 3820! Thaipeng, Wray 131! Scortechini 376! Penang: Waterfall, Curtis! Malacca: Padang Batu, Ridley 10091!

This species, which is here sustained on the authority of Mr. Ridley, who knows well the Malayan *Utricularias* in the field, does not differ very greatly from *U. racemosa*, Wall.; not so much indeed as does the variety *filicaulis* previously described. It matters little whether the three forms are considered specifically distinct or are treated as manifestations of one protean species. A drawing by Mr. Ridley shows pink flowers.

12. UTRICULARIA ORBICULATA, Wall. Cat. 1500. A slender herb growing on wet banks, rocks, or tree-trunks. Leaves all radical or on small offsets, persistent, orbicular or orbicular-spathulate, 15 in. across; petioles distinct 15 to 25 in. long; roots fibrous, sometimes with bladders. Scapes erect, sub-capillary, 2 to 5 in. long; usually 2-4-flowered, sometimes 6-10-flowered; naked or with one or two empty scales, slightly produced at the base; flowers on capillary pedicels 15 to 25 in. long, rather distant; bracts and bracteoles minute, ovate-acute. Calyx 2-lobed, the lower lobe very much smaller than the upper, both obtuse, the upper often emarginate, '12 in. long in fruit and about as broad as long. Corolla pale violet or white with a yellow centre, 2 to 25 in. wide, with an explanate 5-lobed lower lip and a linear sub-acute spur 2 in. long about as long as the lower lip. Capsule globose, 1 in. across, covered by the upper calvx-lobe but projecting beyond the lower. Seeds minute, obovoid, glochidiate throughout the upper thicker half. A. DC. Prod. VIII. 18; Oliv. Journ. Linn. Soc. III. 187; Dalz. & Gibs. Bomb. Flor. 136; Hook. f. Flor. Brit. Ind. IV. 334; Ridl. Journ. Bot. XXXIII. 11. U. pusilla, Grah. Cat. Bomb. Pl. 165. U. glochidiata, Wight Ic. t. 1581.

KEDAH: Telayah Tujon, Curtis! PERAK: Larut, Scortechini 376! on Gunong Bubu, growing on steep side of hill in the sun, amongst moss, at 5,000 feet, flower pale violet; Wray 3880! on Gunong Mas, at 5,000 feet, flower white with yellow centre; Wray 4146! Malacca: Mount Ophir, Griffith; Ridley!—DISTRIB Throughout S.E. Asia.

Order LXXXVII. BIGNONIACEÆ.

Trees or climbing shrubs, more rarely herbs. Leaves opposite, rarely whorled or alternate, entire or 1- 2- 3-pinnate or digitate; leaflets entire or sometimes toothed. Inflorescence of terminal racemes or panicles; bracts various; flowers showy, usually large, hermaphrodite, irregular or regular. Calyx gamosepalous, campanulate, truncate or spathaceous or 2-5-lobed, valvate. Corolla gamopetalous, tubularventricose, mouth 2-lipped; lobes 5, sub-equal, patent or erecto-patent. bilabiately imbricate in bud. Stamens alternate with the corolla-lobes, inserted on the tube, 5 or more usually 4 from the fifth being absent or rudimentary; filaments filiform, often slightly thickened and sometimes hairy at the base; anthers 2 celled, included or shortly exsert; cells oblong or linear, parallel or divergent, dehiscing longitudinally. Disk hypogynous, cushion-like or annular, sometimes absent. Ovary sessile or shortly stalked, superior, 1-2-celled; style long, filiform; stigma of 2 flattened ovate or oblong lobes; ovules numerous, usually horizontal, anatropous, inserted in 2 to many rows in vertical lines along the edges of the septum in each cell. Fruit generally an elongate capsule, loculicidally or septicidally bivalved; the septum enlarged in fruit, deciduous together with the placentas. Seeds transverse, affixed by their margins to the septum or to enlarged placentas, vertically compressed, discoid or trigonous, often with a broad wing, embryo usually enveloped in a fine interior membrane; exalbuminous, cotyledons flattened, sometimes folded, radicle stout, lateral.—DISTRIB. Tropical regions of the world, a few in warm temperate regions; absent from Europe, the Mediterranean region and New Zealand. Species about 50.

Stamens 5; a tree with opposite 2-3-pinnate leaves and very large flat capsules 1. OROXYLUM. Stamens 4; trees:-Anther-cells 2, both perfect :-Leaves 1-3-pinnate: 2. DOLICHANDRONE. Calyx spathaceous, split on one side Calyx lobed or truncate:-Septum of the capsule cylindric, spongy:-Septum prominently pitted; seeds trigonous, transversely grooved without, inner lobe fitting into the septum-pit; ovules 2-seriate in each cell.. 3. Stereospermum. Septum only faintly pitted; seeds flat; ovules many-4. RADERMACHERA. seriate in each cell Septum flat, capsule winged; a large tree with large .. 5. Pajanelia. flowers ..

Leaves simple, often verticillate; calyx usually more or less bilabiate 6. Diplanthera. Anther-cells 1 perfect, 1 reduced to a small hook; a tall tree with 2-3-pinnate leaves and very long narrowly-linear corollatube. 7. Millingtonia.

1. OROXYLUM, Vent.

A glabrous tree. Leaves opposite, large, 2-3-pinnate; leaflets entire. Flowers large, in a long, stout, terminal raceme. Calyx large, leathery, campanulate, truncate or obscurely toothed, persistent. Corolla large, fleshy; tube campanulate-ventricose; lobes 5, 2 in upper, 3 in lower lip, recurved, toothed, crumpled. Stamens 5 inserted near base of tube, posterior one the shortest. Anthers 2-celled; cells parallel, oblong. Disk large, cushion-like. Ovary sub-sessile, contracted at the base, compressed; style slender; stigma 2-lobed; ovules in 4 vertical rows on each placenta, very many. Capsule very large, broadly linear, compressed parallel to the septum, septifragally 2-valved. Seeds very many, flattened, surrounded by a broad hyaline wing.—Distrib. A single S.E. Asiatic species.

Oroxylum indicum, Vent. Dec. Gen. Nov. 8 (1808). A small tree, reaching 30 to 40 feet in height, with a clean bole and few branches or often none, the head bearing leaves only; branches thick; bark somewhat fleshy; pith large. Leaves extremely large, 1-3-pinnate, the lower 3-, middle ones 2-, upper 1-pinnate; 3 to 5 feet long, triangular in outline; rachis smooth, striate, stout, swollen at the base (pulvinus) and joints; primary pinnæ about 45 pairs, the lower ones 2-pinnate at base, pinnules 3- to 5-foliolate; leaflets ovate, entire, acuminate at apex, side ones rounded and often unequal at base, terminal one cuneate at base; 3 to 6 in. long, 2 to 2.5 in. broad; main-nerves 4 to 5 pairs; petiolules slender, 2 to 3 in. long. Raceme branch-like, 2 to 3 feet long, very thick, lower part prominently marked with the ovate scars of fallen pedicels; pedicels 5 in. long, stout; bracteoles fused with pedicels. Calyx campanulate, 1 in. long, fleshy, truncate, with 5 short teeth. Corolla fleshy, 2.5 in. long, yellowish; lobes much crumpled, red, villous on both sides. Stamens 5, shortly exsert; base of filaments woolly; anthers divergent below; connective shortly mucronate. Disk fleshy, cupular, somewhat lobed. Ovary oblong; style slender, hollow, as long as the stamens; stigma 2-lobed, lobes rounded. Capsule shortly stalked, concave-flat, elongate oblong, 1.5 to 2.5 feet long, 2.5 to 3.5 in. broad, scarcely 3 in. thick, margins somewhat incurved, back keeled, valves woody, septum flat. Seeds very many, flat, surrounded by a very thin, hyaline, shining wing, somewhat rectangular in shape, 3 in. long, 1.5 in. broad; testa membranous; cotyledons emarginate, oblong. Kurz For.

Fl. II. 237; Clarke in Hook. f. Fl. Br. Ind. IV. 378; Trimen Fl. Ceyl. III. 281; Koord. & Val. Bijdr. I. 66; Cooke Bomb. Fl. II. 327; Prain Beng. Plants II. 787. Bignonia indica, Linn. Sp. Pl. (1753) 625; Lamk Dict. I. 423; Roxb. Fl. Ind. III. 110; Wall. Cat. 6514. B. pentandra, Lour. Fl. Cochinch. 379. Spathodea indica, Pers. Syn. II. 173. Calosanthes indica, Blume Bijdr. 760; DC. Prod. IX. 177; Wight Ic. t. 1337; Dalz. & Gibs. Bomb. Fl. 161; Bureau Monog. Bign. (1864) t. 9; Miq. Fl. Ind. Bat. II. 752; Brandis For. Fl. 347. "Palegapajaneli," Rheede Hort. Mal. I. t. 43.

PENANG: Curtis 983. PERAK: Scortechini 1613; King's Collector 7033. PAHANG: common on the banks of the river from Pekan up, flowers dull brownish-purple (Ridley in Trans. Linn. Soc. 2nd Ser. III. 326). MALACCA: Maingay (K.D.) 1213.—DISTRIB. India, Ceylon, Burma, Sumatra (Forbes 1284), Java, and east to Cochin China.

2. Dolichandrone, Fenzl.

Trees. Leaves opposite, pinnate, leaflets entire or toothed. Flowers in terminal racemes or panicles, few, large. Calyx spathaceous, cleft to the base down the front, caducous. Corolla-tube long or short, inflated above; lobes 5, nearly equal, crisped on the margin. Stamens 4, didynamous, included; anthers glabrous, the cells oblong, at first parallel, afterwards divergent. Disk annular, cushion-like. Ovary sessile; ovules numerous, usually many-seriate. Capsule elongate, terete or somewhat compressed, straight or incurved, loculicidally 2-valved, the septum often thickened and making 4 spurious cells. Seeds 1 to ∞ -seriate on the margins of the septum, much compressed, the wing thickened or hyaline.—Distrib. Tropical Africa, Asia, and Australia, about 15 species.

Dolichandrone Rheedii, Seem. Journ. Bot. VIII. 380 (1870). A deciduous tree reaching 40 to 50 feet in height of stem; branchlets stout, marked with prominent leaf-scars, innovations glabrous. Leaves imparipinnate, 9 to 12 in. long, leaflets 2 to 4 pairs, with an end one, rachis slender; side leaflets rhomboid, unequal at base, acuminate at apex, margin entire or with few distant serratures, glabrous on both surfaces, 3 to 4 in. long, 1.5 to 2.5 in. broad, main-nerves 6 to 7 pairs, petiolule slender, articulate at base, 3 to 5 in. long; end leaflet similar, but equal at base; all nearly black when dry. Flowers few, usually 1 to 4 in a short terminal corymbose raceme; pedicels glabrous, 1 to 1.5 in. long. Calyx-tube closed in bud and beaked, spathaceous in flower, 1.5 in. long. Corolla white, tubular-funnel-shaped, 4 to 7 in. long; tube slender at first, then gradually expanding; lobes 1 in.

long, crenately crisped, recurved. Stamens 4, didynamous; filaments curved inwards; anther-cells large, oblong, divaricate. Ovary conical, style slender, stigma of 2 rounded lobes. Capsule 1 to 2 feet long, about 1 in. broad, flattened-cylindrical, faintly ribbed, septum thickened in the middle on both sides. Seeds very many, overlapping in many rows, rectangular (with the wings), 5 to 7 in long, 3 in. broad, wings corky; testa membranous; cotyledons flat, deeply emarginate, the lobes nearly orbicular; radicle short. Clarke in Hook. f. Fl. Br. Ind. III. 379; Trimen Fl. Cevl. III. 282; Koord. & Val. Bijdr. I. 69. D. longissima, K. Sch. in Engl. & Prantl Pflanzenfam. IV. 2B. 240, fig. 92 B-D. Bignonia spathacea, Linn. f. Suppl. 283. B. longissima, Lour. Fl. Cochinch. 380? Spathodea longiflora, Vent. Choix. n. 40. S. Rheedii, Wall. Cat 6516; DC. Prod. IX. 206; Wight Ic. t. 1339; Bedd. Fl. Sylv. CLXVIII.; Kurz For. Fl. II. 234; Miq. Fl. Ind. Bat. II. 754. S. ? Loureiriana, DC. l.c. 209? S. Diepenhorstii, Mig. l.c. "Nir Pongelion," Rheede Hort. Mal. VI. t. 29.

Penang: Curtis 1184. Perak: Scortechini 1098; Wray 2501. Pahang: in mangrove swamps (Ridley l.c.). Malacca: Griffith (K.D.) 4066; Maingay (K.D.) 1210.—Distrib. Malabar coast of India, Ceylon, Burma, Andaman Islands, Malay Archipelago east to New Guinea.

3. Stereospermum, Cham.

Trees. Leaves opposite, 1–2-pinnate; leaflets petiolulate, entire or sometimes toothed. Flowers in large lax terminal panicles, white pink or yellow. Calyx ovoid, open or closed in bud, truncate or shortly unequally lobed in flower. Corolla campanulate or funnel-shaped; mouth bilabiate, upper lip 2-, lower 3-cleft; lobes nearly equal, rounded, crisped, toothed or laciniate. Stamens 4, didynamous, included fifth rudimentary; anthers glabrous, cells linear divergent. Ovary sessile, elongate, 2-celled; ovules numerous, 2-seriate in each cell. Disk cupular, fleshy. Capsule elongate, terete or somewhat angled, loculicidally 2-valved; septum thick, corky, cylindrical, pitted to receive the seeds in alternating cavities. Seeds trigonous, with a transverse groove without and a prominent ridge within, which fits into a deep pit in the septum; wings membranous, lying flat upon the septum; cotyledons folded, 2-lobed, radicle straight.—Distrib. Tropical Asia and Africa. About 12 species.

STEREOSPERMUM FIMBRIATUM, DC. Prod. IX. 211 (1844). A large deciduous tree, reaching 70 to 80 feet in height of stem and 1.5 to 3 feet in diam.; bark grey, rough; branchlets stout, innovations and inflorescence viscid-pubescent. Leaves imparipinnate, 1 to 2 feet long; rachis

grooved, viscid-pilose; leaflets 7-9, side ones opposite slightly unequal at base; end one equal, oblong-lanceolate, long-acuminate at apex, rounded at base, entire, membranous, viscid-pilose at any rate when voung, afterwards glabrescent on upper surface; 4 to 6 in. long, 1.5 to 1.75 in. broad; midrib slender, main-nerves about 7 pairs, curving upwards to and along the margin, reticulations prominent, transverse; petiolules of side leaflets 3 to 4 in. long, of end one 1-1.5 in., articulate. Panicle large, very viscid-pilose, dichotomously branched, 5 to 9 in. long and broad; peduncle short, about 5 in. long, thick, secondary peduncles 1 to 1.5 in. long; pedicels slender, about .5 in. long; bracteoles very small, subulate, early caducous. Flowers pale lilac, the tube rather darker. Calyx campanulate, viscid-pubescent without, glabrous within, ·5 in. long; lobes 5, rounded, very short, long-apiculate. Corolla-tube funnel-shaped, 1 to 15 in. long; lobes 5, as long as tube, spreading, long-fimbriate, the laciniæ 025 in. long. Stamens 4, didynamous; filaments slender, glabrous; anther-cells linear-oblong, divaricate, recurved, ·05 in. long. Ovary cylindric, glabrous; style slender, stigma 2-lobed. Capsule cylindric, more or less quadrangular, torulose, 1 to 2 feet long, ·5 in. in diam.; septum thick, corky. Seeds trigonous, with rather thick wings; 1 in. long, 3 in. broad, deeply immersed in alternate pits in the septum. Kurz For. Fl. II. 231; Clarke in Hook. f. Fl. Br. Ind. IV. 383. Bignonia fimbriata, Wall. Cat. 6500.

JUNKSEYLON (Tongkah): Curtis 2912. PERAK: Wray 3334; Scortechini 1746; King's Collector 5701. Pahang: Ridley l.c. Malacca: Maingay (K.D.) 1211.—DISTRIB. Burma.

4. RADERMACHERA, Zoll & Mor.

Trees. Leaves opposite, 1-2-pinnate; leaflets petiolulate, entire. Flowers in terminal racemes or panicles, showy. Calyx urceolate, open or closed in bud, entire or shortly lobed in flower. Corolla funnel-shaped; tube narrow, mouth more or less 2-lipped, upper lip 2-, lower 3-lobed, the lobes spreading, rounded. Stamens 4, didynamous, with a fifth sterile one, included; filaments slender; anthers 2-celled, the cells divaricate. Disk cupular, fleshy, entire. Ovary cylindrical; cells 2; ovules very numerous in many rows in each cell. Capsule slender, compressed, terete, often spirally twisted; the septum slender, continuous, cylindric or compressed, very faintly pitted and bearing on each side a double row of seeds. Seeds very small, rounded, flattened, resting on a very slight depression but not sunk in the septum; wings hyaline, shining; cotyledons flat, not lobed; radicle minute.—Distrib. Burma, the Malay Peninsula, and Malay Archipelago. About 8 species.

1. Radermachera glandulosa, K. Sch. in Engl. & Prantl Naturl. Pflanzenfam. IV. 3B, 243 (1894). A small tree with spreading branches, reaching 15 to 30 feet in height and 6 to 12 in. in diam. of stem.; branches stout, with pale brown, corky bark; branchlets smooth, with prominent oblong lenticels; innovations slightly puberulous. Leaves imparipinnate, 15 to 20 in. long: rachis smooth, swollen at the nodes and at the base, glabrous; leaflets 3 to 7, side ones opposite, slightly unequal at base, end one equal, all furnished with prominent large glands at the base above the petiolule, elliptic or elliptic-oblong, acute or abruptly acuminate at apex, rounded at base, entire, glabrous, chartaceous, 5 to 10 in. long, 3 to 5 in. broad; midrib slender, main-nerves 9 to 11 pairs, arching upwards to and along the margin; reticulations transverse, prominent; petiolules 3 to 4 in. long, end one 1 in. long. Panicles terminal and occasionally axillary, 6 to 12 in. long; peduncle often very long, branches short, scarcely 5 in. long, few-flowered; pedicels slender, 2 to 4 in. long; bracteoles minute, caducous; flowers white, shaded with pink, calvx red. Calvx campanulate, truncate, persistent, ·15 in. long, glabrous, margin undulate only. Corolla-tube cylindric below for 5 in., then campanulate for nearly 1 in., 5 in. wide at mouth, glabrous without, slightly pubescent within; lobes 5, 2 upper smaller than 3 lower, 3 in. long, margins slightly crispate-ciliate. Stamens 4, didynamous, included; filaments slender, anther-cells linear, 1 in. long, divaricate, sterile stamen clavate. Disk cupular, glabrous. Ovary oblong; style slender, .75 in. long; stigmas 2, oblong. Capsule slender, terete, 6 to 10 in. long, 25 in. broad; valves thin, chartaceous, flat after dehiscence, slightly keeled on back; septum cylindric, slightly pitted, white, spongy. Seeds very many, flat, 6 to 8 in. long and 05 to 1 in. broad (including the hyaline often fimbriate wings); testa membranous; cotyledons flat, oblong, broader than long (.05 in.); radicle minute. R. stricta, Zoll.; Bureau Monog. Bign. t. 28. Spathodea glandulosa, Blume Bijdr. 762; DC. Prod. IX. 207; Miq. Fl. Ind. Bat. II. 755. Bignonia Porteriana, Wall. Cat. 6509; DC. l.c. 165. Lagaropyxis glandulosa, Miq. in Ann. Mus. Lugd. Bat. I. 199. Stereospermum glandulosum, Mig. Fl. Ind. Bat. Suppl. 565; Clarke in Hook. f. Fl. Br. Ind. IV. 383; Koord. & Val. Bijdr. I. 74.

Penang: Wallich 6509; Curtis 140. Perak: Wray 1346, 2143; Scortechini 114, 1156; King's Collector 3353, 6379; Kunstler 981. Malacca: Maingay (K.D.) 1217; Goodenough 1960. Selangor: Ridley

8537. NEGRI SEMBILAN: Goodenough 1860. Pahang: Ridley l.c.—Distrib. Burma (Lobb), Sumatra (Forbes 2663, 2693), Java, Borneo (Beccari 811).

2. RADERMACHERA AMÆNA, Seem. Journ. Bot. VIII. 146 (1870). A very tall tree, reaching 80 feet in height, all parts glabrous; branches thick, with prominent leaf-scars. Leaves 2-3-pinnate, apparently 2 feet long or longer, the lower pinnæ only again divided, the upper ones simply pinnate; rachis smooth, thick, swollen and articulate at the nodes. enlarged at foot; petiole about 6 in. long, all joints easily separating when dry: leaflets oblong-lanceolate when young, elliptic-oblong when old, shortly and abruptly blunt-acuminate at apex, rounded or attenuate at base and slightly decurrent, glabrous, entire, coriaceous, 4 to 6 in. long, 2 to 3 in. broad; midrib thick, impressed above, main-nerves about 10 pairs, joined at about 25 in. from the margin in a looped nerve, secondary nerves alternate with the main-nerves, reticulations obscure; petiolules '4 or '5 in. long, channelled above by the decurrent margins of the blade. Panicles much and usually trichotomously branched, rachis terete, upper branches channelled; peduncle about 5 in. long; pedicels slender; bracteoles minute, rounded; flowers white, tinted with pink outside and with yellow streaks within; the calvx dark red. Calvx in bud closed, in flower 2-lipped, the lips bluntly apiculate; tube and lobes equal, 3 in. long, glabrous, deciduous. Corolla-tube shortly cylindric at first for .2 to .3 in. long, then campanulate, glabrous; lobes nearly equal, rounded, crenulate on the margins, 2 to 3 in. long. Stamens 4, with an abortive fifth; filaments thickened and glandular-hairy below, slender and glabrous above; anther-cells linear, curved, divaricate, the connective prominently apiculate. Disk cupular, glabrous. Ovary oblong, flattened; style slender, as long as tube; stigma bilobed, lobes lanceolate; cells 2, ovules very many. Capsule slender, torulose, 12 to 18 in. long, 3 in. broad; valves thin, chartaceous, flattened after dehiscence and then ·25 in. broad, keeled on the back; septum cylindric, spongy, speedily caducous, bearing on each border a row of small seeds. Seeds (with wings) .75 in. long, .1 to .15 in. broad, wings hyaline, rounded; testa membranous; cotyledons flat, oblong, longer than broad; radicle minute. Kurz For. Fl. II. 232. R. gigantea and R. Lobbii, Miq. in Ann. Mus. Lugd. Bat. III. 250. Spathodea amæna, DC. Prod. IX. 208. S. Lobbii, Teys. & Binn. in Nat. Tijdsch. XXV. 413. Spathodea gigantea, Bl. Bijdr. 761; Miq. Fl. Ind. Bat. I. 755; DC. l.c. 207. Bignonia amana, Wall. Cat. 6512 and Pl. As. Rar. II. 78. t. 183. Lagaropyxis gigantea, Miq. in Ann. Mus. Lugd. I. 198. Stereospermum hypostictum, Clarke in Hook. f. Fl. Br. Ind. IV. 384; Koord. & Val. Bijdr. I. 72.

Perak: Scortechini 1496; Wray. Malacca: Griffith (K.D.) 4070; Maingay 1212 (part). Singapore: Maingay (K.D.) 1212 (part); Cantley 79,204.—Distrib. Tavoy, Java.

5. PAJANELIA, DC.

A large tree, glabrous except the flowers. Leaves large, imparipinnate; leaflets entire, numerous. Flowers large, in large terminal thyrsoid panicles, dark red. Calyx large, ovoid and closed in bud, in flower ventricose-campanulate; lobes 5. Corolla-tube cylindric below, ventricose-campanulate above, wide at the mouth; limb sub-bilabrate, lobes 5, spreading, recurved, unequal. Stamens 4, with a rudimentary fifth, didynamous, sub-exsert; filaments slender; anthers glabrous, cells oblong, divergent. Disk annular. Ovary 2-celled, ovules on each placenta numerous, ∞ -seriate. Fruit an elongate narrowly oblong capsule, loculicidally dehiscing, the septum contrary to the valves, the margins of the valves extended in broad wings. Seeds in several rows on the edges of the septum, compressed, with hyaline wings; cotyledons flat, radicle small.—Distrib. A single S.E. Asiatic species.

PAJANELIA MULTIJUGA, DC. Prod. IX. 227 (1845). A large evergreen tree, reaching 60 to 80 feet in height and 2 feet in diam. of stem; glabrous except the corolla; bark 25 in. thick, dark grey, rough; branches thick, lenticellate. Leaves imparipinnate, 1.5 to 3 feet long, glabrous; rachis angular: leaflets 10 to 12 pairs with a terminal one, very unequalsided, elliptic-ovate, acute at apex, rounded at base on the upper, cuneate on the lower side, chartaceous, margins entire recurved, 4 to 8 in. long, 2.5 to 3.5 in. broad; midrib slender, main-nerves 9 on upper, 7 on lower side, reticulations transverse; petiolule stout, ·2 to ·3 in. long. Panieles thyrsoid, 12 to 18 in. long; rachis stout, fleshy, lenticellate; primary branches 1 to 2 in. long, similar, secondary di-tri-chotomously branched; pedicels 5 in, long; bracteoles minute; flowers large, pale vellow, throat purple within. Calyx closed in bud, in flower campanulate, 1 to 1.5 in. long; tube broad at base with keel-like folds without, lobes 5, irregular, acute. Corolla 2 to 2.5 in. long, cylindric below, then somewhat constricted, then ventricose-campanulate; lobes 5, unequal, at first parallel-sided, then broadening into a blunt rounded crispately crenulate limb; the upper part of the tube and the lobes, especially on the margin, grey-pubescent. Stamens 4 with a rudimentary fifth, didynamous; filaments slender, glabrous; anther-cells oblong, divergent. Disk annular, pulvinate, glabrous. Ovary sessile, oblong; style slender, angled, broadening upwards into a 2-lobed clavate stigma; cells 2, ovules very numerous. Capsule flat, lanceolate, broadly winged, the wings split, glabrous, 1 to 1.5 feet long, 2 to 2.5 in. broad; septum transverse, quadrangular in section. Seeds exceedingly numerous, in many rows and imbricating, curved; furnished at either end with a very thin hyaline wing, seeds and wing reaching 1.5 in. long and .5 in. broad; testa membranous; cotyledons obcordate, flat; radicle slender. Bureau Monog. Bign. t. 20; Kurz For. Fl. II. 237. P. Rheedii, Wight Ic. tt. 1343–4; Clarke in Hook. f. Fl. Br. Ind. III. 384; Bedd. Fl. Sylv. CLXIX.; Cooke Bomb. Fl. II. 333; Prain Beng. Plants II. 790. Bignonia indica, var. β Linn. Sp. Pl. 871; Lour. Fl. Cochinch. 460. B. Pajanelia, Ham. in Trans. Linn. Soc. XIII. 316. B. longifolia, Willd. Sp. Pl. III. 306; K. Sch. in Engl. & Prantl Pflanzenfam. IV. 3B, 244. B. multijuga, Wall. Cat. 6503 and Pl. As. Rar. 1. 81, tt. 95, 96. "Pajaneli," Rheede Hort. Mal. I. 44.

Penang: Jack. Perak: Scortechini; King's Collector 2616, 3958.

—Distrib. Eastern Bengal, Burma, Andaman Islands, Malabar coast.

6. DIPLANTHERA, Banks & Solander.

Trees, more or less hairy. Leaves undivided, large, opposite or whorled. Flowers large, yellow, in short thick panicles among the uppermost leaves, the primary branches of the panicles shortly verticillate and densely cyme-bearing. Calyx campanulate, oblong and closed when young, with 2 to 5 valvate lobes connivent in flower and sometimes sub-bilabiate. Corolla tubular-ventricose; lobes 5, rounded, sub-equal. Stamens 4, didynamous, exsert; filaments involute in bud; anthers glabrous; cells linear, at first parallel, afterwards divaricate. Disk thick, pulvinate. Ovary sub-sessile, ovules densely many-seriate. Capsule oblong-fusiform, woody, loculicidally 2-valved; septum flat, thick. Seeds many-seriate, between the margins of the septum, flattened, with a broad hyaline wing.—Distrib. From the Malay Peninsula to New Caledonia and Australia: about 6 species.

DIPLANTHERA BANCANA, Scheffer in Nat. Tijdschr. XXXI. 334 (1870). A lofty tree; branches stout; branchlets pale brown, pubescent, marked with lenticels and prominent leaf-scars. Leaves chartaceous, undivided, ovate, obtuse at apex, cordate at base; margins irregularly undulate, furnished with 1 to 2 glandular pits on the upper surface at the insertion of the petiole; both surfaces slightly pubescent, especially beneath and on the nerves; 8 to 13 in. long, 5 to 8 in. broad; midrib stout, main-nerves 10 to 12 pairs, the lowest 3 close together and spreading more or less downwards or horizontally, the rest distant, irregular, often branched at two-thirds of their length, the branches all anastomosing near the margin; reticulations prominent, transverse; petiole stout, 2 to 4 in. long, base articulate. Panicles terminal, 4 to 5 in. in diam., tawny-villous; common peduncle 5 to 6 in. long, 25 in. thick;

branches easily disarticulating; pedicels slender, '75 in. long; bracts leafy, spathulate, '2 in. long; bracteoles linear-subulate, '1 to '2 in. long; flowers yellow. Calyx campanulate, closed in bud, 5-lobed in flower, '7 to '8 in. long; often 2-labiate, the upper lip with 2 divisions of 2 lobes each, the lower 1-lobed, acute; tube puberulous without. Corolla tubular-ventricose, 1 in. long; lobes 5, uppermost and 2 lowest acute; side lobes broadly obtuse, margins incurved; tube glabrous except for a ring of tawny hairs at the insertion of the filaments. Stamens 4, filaments inserted a little above the base of the tube, involute in bud; anther-cells linear, pendulous. Ovary oblong; style slender; stigmas 2, lanceolate; ovules very many. Capsule 6 in. long, 1·2 in. broad, smooth, valves boat-shaped after dehiscence. Seeds 1·5 in. long, '75 in. broad, winged on 3 sides; cotyledons flat, emarginate, '15 in. long, '25 in. broad. Clarke in Hook, f. Fl. Br. Ind. IV. 385.

Penang: Curtis 870, 1569. Malacca: Walker 283; Maingay (K.D.) 1214.—Distrib. Bangka (Teysmann 7666).

7. MILLINGTONIA, Linn. f.

A tall tree with corky bark. Leaves opposite, 2-3-pinnate; leaflets entire or crenate. Flowers white, in terminal corymbose panicles. Calyx small, cupular, truncate or with 5 short teeth. Corolla white; tube long, slender; limb obscurely bilabiate; lobes 5, sub-equal, subvalvate, the 2 upper connate to near the middle. Stamens 4, didynamous, with no rudimentary fifth, shortly exsert, inserted on the mouth of the tube; anthers 1-celled, the second cell rudimentary, hooked. Disk annular, cushion-like. Ovary sub-sessile, cylindric-conical; style slender; stigma bi-lobed; ovules numerous, in about 4 rows on each placenta. Capsule linear, compressed parallel to the septum, septicidally 2-valved. Seeds very many, flattened, surrounded on 3 sides by a thin hyaline wing.—Distrib. A single S.E. Asiatic species.

MILLINGTONIA HORTENSIS, Linn. f. Suppl. 291 (1781). A tall erect tree reaching a height of 80 feet and a girth of 6 to 12 feet; bark corky, deeply fissured; branches stout, drooping; branchlets somewhat slender, flattened, lenticellate; innovations and young leaves slightly pubescent. Leaves opposite, 2–3 pinnate, about 1.5 to 2 feet long or longer; rachis langular, channelled; leaflets ovate or ovate-lanceolate, acuminate at apex, truncate at base, membranous; glabrous when old, pubescent when young; margins entire or (in young plants and shoots chiefly) broadly crenate; 1 to 2 in. long, 1 to 1.5 in. broad; midrib prominent, raised on both surfaces as are the 4–5 pairs of main-nerves; petiolules slender, in upper leaflets often none. Panicles 8 to 12 in. long, branches divaricate; rachis somewhat angular, flattened; peduncles

1 to 3 in. long; bracts and bracteoles very small, caducous; pedicels slender, 3 to 4 in. long; flowers white. Calyx cupular, 1 in. long; lobes very shallow, rounded, recurved. Corolla-tube very slender, 1.5 to 2.5 in. long, about .07 to .1 in. broad, glabrous; lobes ovateoblong, acute, pubescent within, 5 to 6 in. long, 2 to 3 in. broad. Stamens inserted at the top of the tube; filaments slender, 4 to 5 in. long; anthers rounded, ovate. Ovary slender; style very slender, exsert, stigma-lobes ovate. Disk cushion-like, 05 in. high. Capsule about 12 to 15 in. long and 75 in. broad, acute at both ends; valves woody, septum ultimately free. Seeds in several rows along the margins of the septum, much overlapping, including the wing about 1 in. by ·5 in.; wing narrow at the apex, hyaline. DC. Prod. IX. 182; Wight Ill. 16 bis fig. 6; Bureau Monog. Bign. t. 8; Bedd. Fl. Sylv. Madr. t. 249; Brandis For. Fl. 347; Kurz For. Fl. II. 238; Clarke in Hook. f. Fl. Br. Ind. IV. 377; Cooke Bomb. Fl. II. 334; Prain Beng. Plants 788. Bignonia Azedarachta, Koen. Ann. Bot. I. 178. B. suberosa, Roxb. Cor. Pl. III. 11, t. 214 and Fl. Ind. III. 111; Wall. Cat. 6513.

MALACCA: Maingay (K.D.) 1215. SINGAPORE: Deschamps.—Distrib. India, Burma (fide Kurz), Sumatra (Miq. Fl. Ind. Bat. Suppl. 565).

Whether the specimens were gathered from really wild trees there is nothing to show, but if Kurz is right in his statement that the cork-tree, so well known in India in cultivation, is wild in tropical forests from Martaban to Tenasserim, it may well occur in a wild state further south in the Peninsula.

Order LXXXVIII. PEDALINEÆ.

[By D. PRAIN.]

Herbs or undershrubs. Leaves opposite or the upper alternate, entire toothed or lobed; stipules 0. Flowers irregular, solitary or, rarely, clustered or racemose, usually axillary; pedicels short; bracts minute or 0. Sepals 4-5, slightly connate below. Petals connate in a tubular-ventricose corolla; limb 5-lobed, obscurely 2-lipped; lobes imbricate. Stamens 4, didynamous, rarely 2. Carpels 2, connate in a 2-celled, rarely 1-celled ovary; ovules many or few, superposed; style filiform; stigma shortly 2-lobed. Fruit hard, indehiscent, or a 2- (less often 3-4-) valved capsule. Seeds without wings; albumen 0.—Distrib. Species about 40, in tropical and sub-tropical countries.

Sesamum, Linn.

Erect or prostrate herbs. Leaves opposite below, alternate above, entire toothed, lobed, or divided. Flowers axillary, solitary or few and

fascicled, shortly pedicelled. Sepals connate in a small 5-partite calyx. Corolla 2-lipped; tube ventricose; lobes rounded, those of the upper lip rather smaller than the others. Stamens 4, didynamous, included; anthers sagittate, cells sub-parallel, distinct. Carpels connate in a 2-celled ovary; cells soon divided into two chambers by a false dissepiment intruded between the placentas; ovules many, 1-seriate in each chamber; style filiform; stigma 2-lobed. Fruit an oblong or ovoid capsule, usually 4-angled and 4-grooved, 4-chambered, loculicidally 2-valved. Seeds many, obliquely oblong, somewhat compressed, foveolate.—Distrib. Species 10, Africa and S.E. Asia.

SESAMUM INDICUM, DC. Prod. IX. 250. An erect pubescent or puberulous herb, 1 to 2 feet high. Leaves oblong or ovate, variable, the lower often lobed or pedatisect; the middle ovate, toothed; the upper often narrow-oblong, sub-entire; blade 3 to 5 in. long; petioles 5 to 2 in. Flowers axillary, solitary rarely 2-3-nate; pedicels 5 in. long. Calyx-lobes 25 in. long, lanceolate. Corolla pubescent, 1.25 in. long. whitish or with red, or purplish, or yellow marks. Capsule oblong, tetragonous, erect, scabrid-pilose, 1 in. long, uniformly 25 in. wide throughout; apex usually shortly acuminate; dehiscence usually by 2 valves half-way down, sometimes to the base, and sometimes each valve subsequently divided. Seeds brown, smooth. Wall. Cat. 6408; Wight Ill. 163; Hook, f. Flor, Brit, Ind. IV. 387; Bot. Mag. t. 1688. S. orientale, Linn. Sp. Pl. 634; Gaertn. Fruct. II. 132 t. 110; Lamk Ill. t. 528; Roxb. Flor. Ind. III. 100. S. luteum, Retz Obs. VI. 31; DC. Prod. IX. 250. S. occidentale, Her. & Reg., DC. Prod. IX. 250; Thw. Enum. 442. Rumph. Herb. Amb. t. 76, f. 1. Rheede Hort. Malab. IX. tt. 54. 55.

Penang: Wallich! King! Perak: Wray! Scortechini! Malacca: Derry! Johore: Fielding! Singapore: Hullett!—Distrib. Cultivated in all hot countries.

JOURNAL

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Materials for a Flora of the Malayan Peninsula.—By Sir George King, K.C.I.E., LL.D., F.R.S., late Superintendent of the Royal Botanic Garden, Calcutta, and J. Sykes Gamble, C.I.E., F.R.S., late of the Indian Forest Department.

No. 19.

This part contains three Families, Nos. 75 Apocynaceæ and 76 Asclepiadaceæ, both done by Mr. Gamble, with No. 77 Loganiaceæ, done by Sir G. King, with the exception of the genus Strychnos, contributed by Mr. Gamble.

The 3 Families comprise 86 genera and 234 species. There are 2 new genera and 70 new species.

Family LXXV.—APOCYNACEÆ.

Trees or erect or climbing shrubs, rarely herbs; more or less laticiferous. Leaves simple, generally opposite, sometimes whorled, rarely alternate or scattered, entire, penninerved; stipules none or represented by interpetiolar ridges or glands. Inflorescence generally of terminal or pseudo-terminal or axillary cymes which are solitary or clustered in 2- or 3-chotomous panicles, corymbs or pseudo-umbels; bracts usually small and caducous; flowers small to large, often showy, hermaphrodite, regular. Calyx inferior; tube usually very short; lobes 5, imbricate, often with (usually scale-like) glands inside near the base. Corolla gamo-petalous, salver-shaped or funnel-shaped, rarely campanulate urceolate or subglobose, often with scales or a ring or protuberances in the mouth of the tube; lobes 5 (rarely 4), spreading, often contorted or twisted in bud, rarely valvate, overlapping to the right or left (as seen from outside). Stamens 5, rarely 4, alternate with the corolla-lobes, inserted in the corolla-tube or on its mouth; filaments short, often decurrent in

ridges inside the tube; anthers linear-oblong or sagittate, free or connivent in a cone and adhering to the stigma by the connective: cells 2, longitudinally dehiscing, sometimes produced at the base in barren spurs: pollen granular, usually spherical, with 3 pores or 2 to 3 rounded protuberances. Disk none, or annular or cupular, or reduced to 2 to 5 scales or glands. Ovary superior, free or somewhat adnate to the disk, 1-celled with 2 parietal placentas, or 2-celled with axile placentas, or of 2 distinct or partially connate carpels; ovules in each cell 2 or few or many and 2- to ∞ -seriate, rarely solitary, anatropous. usually pendulous; style 1, entire or divided at the base; stigma various. usually ending in a bifid apiculus and frequently with a ring or other appendages, often viscous. Fruit a dry or fleshy drupe, berry or samara, or of two baccate or follicular mericarps. Seeds various, often compressed, sometimes winged, sometimes with a tuft of hairs at one or both ends: testa coriaceous, crustaceous or membranous: albumen hard, fleshy or scanty or none; embryo straight; cotyledons flat, concave, convolute or contorted; radicle superior.—DISTRIB. Chiefly tropical; genera about 110 to 120; species probably about 1000, or even more.

Anthers included, free from the stigma, cells rounded at the base; corolla-lobes usually overlapping to the left:—

Ovary of 2 wholly combined carpels, 1-2-celled; fruit large, usually fleshy or pulpy within; seeds without wing or pencil of hairs (coma) (Tribe I. Carisseæ):—

Ovary 1-celled, with parietal ovules :-

Fruit indehiscent; albumen none .. . 1. Willughbeia. Fruit 2-valved; albumen present .. . 2. Chilocarpus.

Ovary 2-celled, with axile ovules :-

Flowers 4-merous; albumen none; corolla-throat naked

Flowers 5-merous; albumen present; corolla-throat with lobed scales

Ovary of 2 distinct carpels, united by the style; fruit various,

seeds peltate (Tribe II. Plumerieæ):—

Calyx eglandular within; carpels 1-2-, rarely 4-6-ovuled; fruit of 2 1-seeded drupes or berries, rarely moniliform (Subtribe 1. RAUWOLFILEE):—

Leaves usually whorled :-

Albumen ruminate; erect or climbing shrubs with more or less coriaceous leaves

Albumen even; erect shrubs with fleshy or soft leaves, membranous when dry

Leaves opposite; disk none; albumen smooth

Calyx glandular within:

Carpels 2-, rarely 4-ovuled, ovules on opposite sides of a thick placenta; fruit a 1- or 2-seeded drupe or berry (Subtribe 2. CERBERINE):—

. OHILIOOMILEOS.

3. LEUCONOTIS.

4. MELODINUS.

5. ALYXIA.

6. RAUWOLFIA.

7. HUNTERIA.

Leaves alternate or scattered; corolla funnel-shaped, large, lobes overlapping to left; fruit drupaceous, over		
2 in. long		CERBERA.
nous when dry; fruit drupaceous, over 2 in. long Leaves opposite, membranous to subcoriaceous; fruit	9.	Ochrosia.
Carpels 6-\pi-\phi-\phi-vuled; fruit of 2 follicular mericarps (Subtribe 3. Euplumerine):— Leaves in whorls, main-nerves prominent; cotyledons flat:—		Kopsia.
Follicles slender, long, cylindric; seeds small, ob- long, with tufts of hair at the ends; style filiform;		
stamens usually near the top of the tube Follicles very large, stout; seeds large, with a membranous wing; style none or minute; stamens		ALSTONIA.
usually at the middle of the tube		DYERA.
Leaves opposite:— Follicles slender, with comose seeds; style short;		
		Holarrhena.
seeds; style filiform; cotyledons flat Anthers included or exserted, conniving in a cone around the top of the style and adherent to the stigma by a point on the connective, cells produced downwards into empty spurs; ovary of 2 distinct rarely connate carpels united by the style; fruit of 2 follicular mericarps; seeds comose at one or both ends (Tribe III. Echitice):—		ERVATAMIA.
Corolla-lobes imbricate; carpels separate:— Corolla-throat naked; cotyledons flat:—	15.	Parsonsia.
Corolla rotate; connective of anthers thickened at back	16.	Vallaris.
Corolla hypocrateriform; connective not thickened Corolla-throat usually with scales, rotate or hypocrateri-		
form; cotyledons convolute Anthers included:—	18.	WRIGHTIA.
Corolla-throat with 5-10 scales (Subtribe 2. Nerinæ):— Corolla-lobes long or tailed Corolla-throat naked (Subtribe 3. Echitidinæ):— Corolla-lobes valvate or overlapping to the left:—	19.	Strophanthus.
Corolla-lobes valvate, tube urceolate; flowers minute Corolla-lobes overlapping to left, tube subcampanulate;	20.	URCEOLA.
flowers small	21.	Parameria.
	22.	Ecdysanthera.

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Corolla hypograteriform, lobes twisted to left in bud:-
  Seeds beaked :-
    Lobes of corolla not markedly spiral in bud: beak
    of seed with tufted coma :-
      Albumen of seed present; flowers, leaves and
                                                  .. 23. CHONEMORPHA
      follicles very large
      Albumen of seed none; flowers, leaves and
      follicles moderate-sized . .
                                                  .. 24. RHYNCHODIA.
    Lobes of corolla markedly spiral in bud; coma of
    seed decurrent on the beak
                                                  .. 25. ANODENDRON.
  Seeds not beaked :-
    Seeds narrowed at the end: cotyledons linear:-
      Albumen scanty; corolla-lobes entire, rounded
                                                     26. CLEGHORNIA.
      Albumen copious; corolla-lobes fimbriate, acu-
                                                  .. 27. ICHNOCARPUS.
    Seeds usually broadened at the end :-
      Cotyledons oblong, or linear-oblong; corolla
      rather large, lobes more or less rounded :-
        Calvx 5-partite, lobes lanceolate; cymes
        corymbose :--
          Apex of seed slender below the tuft of the
           coma: follicles terete
                                                  .. 28. AGANOSMA.
           Apex of seed broadly flattened below the
           tuft of the coma; follicles more or less
                                                    29. Trachelospermum.
         Calvx 5-fid, lobes narrow; cymes paniculate 30. Epigynum.
       Cotyledons narrowly linear; corolla very small,
      lobes very oblique, usually forked ...
                                                  .. 31. MICRECHITES.
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The following plants of this Family are cultivated, and seem to be occasionally found run wild in the Peninsula:—

- 1. Allamanda cathartica, Linn. Mantiss. II. 214 (1771). A scandent milky shrub, native of South America. It has oblanceolate acuminate leaves in whorls of 2 to 4 and large yellow flowers. Penang: G. King; Deschamps. Singapore: T. Anderson.
- 2. Carissa Carandas, Linn. Mantiss. I. 52 (1767). A large evergreen thorny shrub, native of India, with small white flowers and an edible fruit. Malacca: *Maingay*.
- 3. LOCHNERA ROSEA, Reichb. Consp. Reg. Veg. 134 (1828). A garden shrub with shining obovate leaves and white or pink flowers; common in gardens, and also found run wild on roadsides especially near the coast. It is probably native of the West Indies. Penang: Curtis 1067.

There are probably others, which, like *Plumeria acutifolia*, Poir., *Nerium Oleander*, Linn., and *Thevetia neriifolia*, Juss., are commonly cultivated in gardens in the Peninsula, but do not run wild. We have, however, seen no specimens.

Tribe I.—Carisseæ.

1. WILLUGHBEIA, Roxb.

Large sarmentose or climbing shrubs, generally bearing tendrils which are modified peduncles. Leaves opposite, shortly petiolate, penninerved. Flowers in dense, rarely in lax, axillary cymes; pedicels enlarged in fruit. Calyx 5-partite, eglandular. Corolla hypocrateriform, the mouth naked; lobes broad or linear, overlapping to the left, nearly straight in bud. Stamens inserted near the base of the tube, included; anthers lanceolate, the connective apiculate, the cells rounded at the base. Disk none. Ovary entire, 1-celled; style short, its top obconic or urceolate; stigma capitate or ovoid-conical, often slightly annulate at the base and slightly bifid at the apex; ovules numerous, on two parietal placentas. Fruit a large globose berry with a hard pericarp. Seeds numerous, embedded in pulp, ellipsoid, compressed; albumen none; cotyledons fleshy, thick, plano-convex; radicle short.—Distrib. India, Ceylon, Burma, Malay Peninsula and Archipelago; about 12 species.

Cymes with stout peduncles and pedicels; stamens usually near the base or middle of the corolla-tube; stigma conical, on a short style (Subgenus I. Euwillugheela):—		
Main nerves of leaves 6 to 8 pairs; leaves orbicular or elliptic, pale when dry, glaucescent beneath; corolla-lobes 1 in. long	1.	W. grandiflora.
Main nerves of leaves 10 to 16 pairs, rather distant:— Corolla-lobes 3 to 4 in. long; leaves scarcely coriaceous:— Cymes few-flowered, nearly glabrous; leaves long acu-		
minate	2.	W. edulis.
a short blunt tip	3.	W. oblonga.
nearly so :—		
Main nerves flattened on lower surface of coriaceous leaves Main nerves sharp and slender on lower surface of thinly	4.	W. coriacea.
	5.	W. firma.
Corolla-lobes 3 in. long; leaves thinly chartaceous, up to		
10 in. long, blunt acuminate at apex Corolla-lobes 4 to 7 in. long; leaves thinly coriaceous,	6.	W. martabanica.
hardly over 6 in. long, sharply acuminate at apex Cymes with slender peduncle and pedicels; stamens near the top of the corolla-tube; stigma cylindric, seated on the obconic	7.	W. tenniflora.
top of the slender style (Subgenus II. URNULARIA):— Main nerves of leaves under 20; corolla-lobes ovate, recurved		
in flower	8.	W. flavescens.
Main nerves of leaves over 20; corolla-lobes narrowly oblong, erect in flower.	9.	W. rufescens.

1. WILLUGHBEIA GRANDIFLORA, Dyer in Herb. Kew.; Hook. f. Fl. Br. Ind. III. 625 (1882). A stout climbing shrub; branchlets stout, dark brown to nearly black; tendrils woody, thick, branched. Leaves coriaceous; orbicular or elliptic, obtuse or with a very short blunt broad acumination at apex, rounded at base; glabrous and shining, pale reddish-yellow on the upper surface, cinnamon-coloured, soft and glaucescent on the lower; margins slightly recurved; 3 to 5 in. long, 3 to 3.5 in. broad; midrib stout, impressed on the upper surface, somewhat flattened on the lower; main nerves 6 to 8 pairs, distant, impressed above, raised beneath, at an angle of about 60° with the midrib, at first straight then curving near the margin to meet in an irregular intramarginal nerve; secondary nerves few and chiefly near the apex; reticulations transverse, distinct but not prominent; petiole stout, rugose or corrugated, channelled above, 5 to 1 in. long. Cymes sub-sessile, crowded, puberulous; bracteoles broadly ovate, ciliate; pedicels stout, 05 to 1 in. long; buds cylindric-clavate, ·45 in. long; flowers white, reddish at base. Calyx broad, thick, ·1 in. long; lobes rounded, much imbricate, obtuse, ciliate, longer than the short tube. Corolla-tube slender, 5 in. long, slightly dilated near the base opposite the stamens, villous within above the stamens; lobes 1 in. long, oblong-spathulate, long-ciliate on the margins, rounded at tip. Anthers lanceolate, apiculate, base cordate, '06 in. long; filaments slender, short, curved. Ovary broad-conical; style short, cylindric, urnshaped at top: stigma conical, bifid, branches slender. Fruit not seen. Ancyclocladus glaucinus, Pierre in Bull. Soc. Linn. Par. nouv. sér. 98.

MALACCA: *Maingay* (K.D.) 1047. — DISTRIB. Borneo (*Beccari* 3335; *Haviland* 2301, 3045).

2. Willughbeia edulis, Roxb. Cor. Pl. III. t. 280 (1819), and Fl. Ind. II. 57. A large climbing shrub; bark dark brown, tubercled; branchlets slightly angled, pale brown to dark brown, prominently lenticellate; tendrils long, branched. Leaves chartaceous when dry; oblong or obovate-oblong, long acuminate at apex, cuneate at base; olivaceous-brown and dull on the upper surface, reddish-brown and sometimes shining on the lower; margins crispately undulate, slightly recurved; 4 to 7 in. long, 2·5 to 3·25 in. broad; midrib stout, impressed on the upper, raised on the lower surface; main nerves 12 to 16 pairs, starting at an angle of 50° to 60° with the midrib and curving upwards to anastomose near the margin; secondary nerves few, chiefly near the ends; reticulations transverse, fairly prominent; petiole ·2 to ·6 in. long. Cymes axillary, few-flowered, about as long as the petioles; peduncle stout, ·15 in. long; bracteoles ovate, acute, early caducous, leaving a prominent scar; pedicels short, angular; buds oblong-clavate,

about ·5 in. long; flowers white or pink. Calyx-lobes ·05 to ·075 in. long, ovate, acute, ciliate; tube shorter than lobes. Corolla-tube cylindric, dilated in the middle opposite the stamens; lobes lanceolate, ·35 to ·4 in. long, ciliate on the edges. Anthers sub-sagittate, ·05 in. long; filaments short, bent. Ovary conical, acute; style short; stigma conical, striate, puberulous. Berry large, sub-ovate, the size of a lemon; pericarp orange-coloured, thick. Seeds many, in a yellowish fibrous pulp; cotyledons thick, fleshy. A. DC. Prodr. VIII. 321; Kurz For. Fl. II. 165; Hook. f. Fl. Br. Ind. III. 623 (in part); Bl. Bijdr. 1034; Miq. Fl. Ind. Bat. II. 391. Hunteria?, Wall. Cat. 9066.

DINDINGS: Pangkor, at Gunong Tunggyal, Curtis 1629.—DISTRIB. India (Assam, Sylhet, Chittagong), Burma.

3. WILLUGHBEIA OBLONGA, Dyer in Herb. Kew.; Hook. f. Fl. Br. Ind. III. 625 (1882). A large climbing shrub; branchlets very stout, obtusely angled, with pale greyish-brown bark rough with close-set small lenticels. Leaves chartaceo-coriaceous; elliptic or elliptic-oblong, obtuse at apex or with a short broad blunt or almost emarginate acumination, rounded at base or somewhat acute when young, almost auricled; both surfaces when dry dark reddish-brown, opaque; margins recurved; 3 to 6 in. long, 1.5 to 3 in. broad; midrib broad, flat on the upper, raised on the lower, surface; main nerves 10 to 15 pairs, irregularly spaced, the lower ones rather near together, the middle and upper ones further apart, starting at about 70° with the midrib and gradually curving upwards to anastomose near the margin; secondary nerves few and inconspicuous; reticulations many, irregularly netted; petiole stout, 25 in. long. Cymes small, sessile, dense-flowered, pubescent; bracteoles ovate acuminate; pedicels 05 in. long; buds oblong-clavate, ·25 to ·5 in. long. Calyx-lobes ovate-oblong, ciliate, pubescent within, ·075 in. long; tube thick, short. Corolla-tube cylindric, ·2 in. long, dilated in the middle opposite the stamens; lobes 3 to 4 in. long, linear-oblong, ciliate at the margins. Anthers lanceolate, apiculate, ·05 in. long; filaments short, curved. Ovary glabrous, conical; style slender; stigma conical. Berry many-seeded, oblong; pericarp leathery, rough. Seeds ovoid, 5 in. long; testa thin; cotyledons fleshy.

Malacca: Maingay (K.D.) 1089; at Ayer Panás, Goodenough 1396.
4. Willughbeia coriacea, Wall. Cat. 1620 (1829), and Pl. As. Rar.
III. 45 (1832). A large glabrous climbing shrub; branches stout, obscurely angled, black, enlarged at the nodes; branchlets slender, angled, smooth; tendrils slender, branched. Leaves coriaceous; elliptic or elliptic-lanceolate, acute or shortly and bluntly acuminate at apex, cuneate or rounded at base; glabrous and shining on both surfaces when dry especially on the upper, both surfaces reddish-brown when

dry, the upper tinged with olivaceous; margins recurved, more or less cartilaginous; 3.5 to 6 in. long, 1.5 to 2.5 in. broad; midrib stout, broad, impressed above; main nerves 10 to 12 pairs, starting at 70° with the midrib, at first straight then curving to near the margin, where they are joined by small loops, raised on the upper, raised and flattened on the lower surface; reticulations obscure, more visible on the upper surface; petiole 3 to 4 in. long, stout, channelled above. Cymes sessile, crowded, less than 1 in. long; bracteoles very small, broad, obtuse, persistent, ciliate; flowers white; buds cylindricclavate, 4 to 5 in. long. Calyx 15 in. long, subhemispheric; lobes rounded, obtuse, ciliate. Corolla thickly coriaceous; tube inflated in the middle opposite the stamens, constricted at the base and at the mouth, - 15 to 2 in. long; lobes oblong, obtuse, 25 in. long, the margins incurved. Anthers ovate-lanceolate, apiculate, 05 in. long; filaments slender, Ovary ovoid-globular, conical, glabrous; style short, .025 in. long; stigma cylindric-conical with a broad white annulus at its base. Berry obovoid, 3 in. long by 2.25 in. in diam., yellow when ripe; pericarp thick, leathery. Seeds red, '75 in. long, embedded in pulp, which hardens in drying. A. DC. Prodr. VIII. 321; Hook. f. Fl. Br. Ind. III. 623; Mig. Fl. Ind. Bat. II. 391.

Penang: on Government Hill, Curtis 847; Ridley 9359. Perak: Scortechini; King's Collector 5331, 6976. Malacca: Griffith; Maingay (K.D.) 1048; Curtis 3485; Derry 120, 399, 461, 1190, 1198. Singapore: Wallich 1620; Lobb; Hullett 511, 626; Ridley 1641, 3594, 9501.

5. WILLUGHBEIA FIRMA, Blume Mus. Bot. Lugd.-Bat. I. 154 (1850). A large glabrous climbing shrub; branches stout, obtusely angled, bark reddish-brown or -grey, smooth, fissured; branchlets similar, nearly quadrangular, lenticellate; tendrils branched, slender. Leaves thinly coriaceous; elliptic to elliptic-lanceolate or elliptic-oblong, shortly and obtusely acuminate at apex, acute or cuneate at base; both surfaces glabrous, shining, the upper more or less olivaceous when dry, the lower reddish-brown; margin slightly recurved; 3 to 5 in. long, 1.25 to 2.25 in. broad; midrib stout, rather impressed above; main nerves 10 to 15 pairs, slender, starting at an angle of 70° to 75° with the midrib and at first straight then curving and branching so as almost to meet near the margin, prominent on the under, obscure on the upper, surface; secondary nerves few, between successive main nerves and at a different angle; reticulations distant, obscure; petiole 4 to 5 in. long, stout. Cymes axillary, sub-sessile, many-flowered, not much longer than the petioles; bracteoles broadly ovate, obtuse; buds oblong-clavate, 3 to 4 in. long, striated by the lobes of the corolla; flowers white or pale yellow. Calyx campanulate, 1 to 15 in. long; lobes half the length, ovate, obtuse, ciliate. Corolla-tube cylindric, dilated in the middle opposite the stamens, 2 in. long; lobes as long as or slightly longer than the tube, linear-oblong, margins sometimes incurved, glabrous. Anthers ovate, acute, '03 in. long; filaments slender, short. Ovary ovoid, acute; style short; stigma ovate-conical with a bifid tip. Berry ovoid or pyriform, orange-yellow, 3 to 4 in. long, 2 to 2.5 in. broad; pericarp thick. Seeds embedded in pulp, red, '5 in. long or longer, elliptic-oblong, planoconcave; testa membranous; cotyledons thick. Miq. Fl. Ind. Bat. II. 390; Hook. f. Fl. Br. Ind. III. 624; Hook. Ic. Pl. t. 2344; Stapf in Trans. Linn. Soc. Ser. 2, IV. 207. W. Burbidgei, Dyer in Kew Gard. Rep. 1880, 44, 46.

Kedah: on Lankawi Island, Curtis. Penang: Curtis 1500; Ridley 9468. Perak: Scortechini 651, 2120; Wray 5, 594, 3208, 4176; King's Collector 6663, 10050, 10854. Malacca: Griffith; Derry 101; Hervey; Irving 228; Curtis 3476. Singapore: Murton 58; Cantley 95; Ridley 4421, 4431, 5713, 6522.—Distrib. Sumatra, Borneo (Beccari 2273; Ridley 9055, &c.).

This species is with difficulty distinguished from W. coriacea, but its leaves are less coriaceous, and the main-nerves are usually closer, and are slender and sharp instead of being broad and flattened. The fruit is edible, and the stems give a kind of gutta-percha or rubber (Curtis). Curtis's specimens bear the Malay names "Gutta Garoo," "Gutta Garok," "Getab Ujol," "Getah greep betina." The Fl. Br. Ind. gives "Gutta Singgarip," after Murton. As Stapf remarks in Hook. Ic. t. 2344, the Kew material shows that, in Borneo especially, there are varieties locally known by different names, and differing chiefly in the fruit, which ought to be studied on the spot.

King's Collector 7729 from Gunong Budo, Perak, at 500 to 800 ft., seems to be a large-leaved variety of this species. The leaves reach 7 in. in length and 3.5 in. in breadth; when dry they are greenish on the upper and shining brown on the lower surface. The flowers are in sessile cymes, and the corolla has oblong blunt lobes.

6. Willughbeia Martabanica, Wall. Cat. 1619 (1827), and Pl. As. Rar. III. 45, t. 272 (1832). A large glabrous climbing shrub; branches stout, dark brown; branchlets dark brown, lenticellate; tendrils long, branched. Leaves thinly chartaceous; oblong or ovate-oblong, or ovate-lanceolate, or obovate, shortly, bluntly and abruptly acuminate at the rounded apex, or with a short broad obtuse or emarginate point, acute or cuneate at base; both surfaces shining, the lower paler; margins recurved, undulate; 3 to 10 in. long, 1·25 to 3·5 in. broad; midrib stout, slightly channelled above, raised beneath; main nerves very many, 20 to 26 pairs more or less, parallel, at an angle of from 70° (middle) to nearly 90° (ends) with the midrib, straight to near the edge and then rather suddenly curving and anastomosing; secondary nerves very many, between and often difficult to distinguish from the main-

nerves, frequently recurrently branching; reticulations many, prominent; all more or less raised on the upper surface; petiole 25 to 5 in long slender. Cymes axillary, sessile, about twice as long as the petiole dense-flowered: pedicels scarcely 05 in, long, pubescent: bracteoles ovate-lanceolate, sheathing the cyme-branches; buds oblong-clavate about 5 in, long; flowers pink or orange-vellow. Calux deeply lobed. nearly glabrous, 1 in, long: lobes broadly ovate, obtuse, ciliate. Corollatube cylindric, slightly dilated in the middle opposite the stamens. ·175 in. long, slightly pubescent within; lobes oblong-falcate, obtuse. 3 in. long, margins sparsely ciliate. Anthers sagittate, the tips nearly reaching the throat of the corolla-tube; filaments slender. broadly ovoid, glabrous; style slender; stigma cylindric-conical. Berry ovoid-globose, 3 to 4 in. in diameter; pericarp orange-yellow, thick, hard, the seeds embedded in a fibrous edible vellowish pulp. Seeds flattened, nearly orbicular in outline: testa leathery; cotyledons thick conform to the seed, plano-convex; radicle minute. A. DC, Prodr. VIII. 321; Kurz For. Fl. II. 165. W. edulis, Roxb.; Hook. f. Fl. Br. Ind. III. 623 (in part). W. dulcis, Ridley in Trans. Linn. Soc. Ser. 2, III, 319.

Penang: Curtis 687. Malacca: Griffith; Goodenough 1450. Pahang: at Praman, near Pekan, Ridley 1022.—Distrib. Burma.

7. WILLUGHBEIA TENUIFLORA, Dyer in Herb. Kew.; Hook. f. Fl. Br. Ind. III. 625 (1882). A large climbing shrub; branches with black bark: branchlets grevish-brown, lenticellate, striate when dry: innovations puberulous. Leaves thinly coriaceous, membranous when young: elliptic, elliptic-oblong or oblanceolate, sharply and somewhat abruptly acuminate at apex, cuneate at base; both surfaces glabrous and somewhat shining when dry, the upper dark olivaceous-brown, the lower bright reddish-brown; margins cartilaginous, recurved, almost revolute; 4 to 6 in. long, 1.25 to 2 in. broad; midrib slender, prominent, red; main nerves 20 to 30 pairs, very slender, the middle ones at from 70° to 80° with the midrib, the upper at a less angle, the lower nearly or quite at right angles, straight to near the margin where they branch and curve slightly, prominent beneath, less so above; secondary nerves occasional, between and similar to the main-nerves; reticulations invisible except in very young leaves; petiole .5 to .6 in. long, channelled above. Cymes axillary, about twice as long as the petioles, densely crowded with many short few-flowered branches, rusty-puberulous like the calyx, pedicels and bracteoles; bracteoles ovate, acute, deciduous; pedicels 05 to 1 in. long; buds oblong-clavate, elongate, reaching nearly 1 inch; flowers white. Calyx campanulate; lobes ovate, obtuse. ciliate, 1 in. long. Corolla-tube narrowly cylindric with a nearly globular dilatation close above the base and opposite the stamens,

·4 in. long, villous within above the stamens; lobes ·4 to ·7 in. long, oblong-falcate, obtuse. Anthers cordate-lanceolate, ·075 in. long; filaments slender, puberulous, bent close to the back of the connective and there attached to a broad swelling. Ovary hemispheric, top nearly truncate; style short, thick, ellipsoid; stigma conical. Berry 4 in. long, "pyriform, abounding in caoutchouc; pericarp thick, leathery; seeds many, naked; cotyledons pink, fleshy" (Maingay).

Perak: Ridley 3075; Wray 3773. Dindings: Curtis. Malacca: Griffith; Maingay (K.D.) 1049; Curtis 3484; Hervey; Cantley 105; Goodenough 1785. Singapore: Ridley 11333.— Distrib. Sumatra (van Romburgh 469).

Curtis says that the caoutchouc of this species is of no use. Wray No. 3773 is a specimen in young fruit; the fruits terminal! but otherwise like other specimens. The apparently terminal fruits probably arose from the cymes of the uppermost axils, the much enlarged pedicels having absorbed the rest of the small inflorescence or caused it to fail. The Sumatra specimen has a less puberulous inflorescence, but otherwise does not seem to differ.

8. WILLUGHBEIA FLAVESCENS, Dyer in Herb. Kew.; Hook. f. Fl. Br. Ind. III. 625 (1882). A slender climbing shrub, all parts glabrous: bark dark grey, rough, with large elliptic lenticels; branchlets dull grevish- or reddish-brown when dry, obtusely angled, the nodes swollen, bases of fallen leaves tuberculate. Leaves coriaceous; elliptic, shortly and bluntly acuminate at apex, rounded or sometimes shortly cuneate at base; both surfaces glabrous, the upper dark greenish-brown, the under pale reddish-brown when dry; margins cartilaginous, recurved; 2.5 to 4.5 in. long, 1.25 to 2.25 in. broad; midrib stout, impressed above; main nerves slender, 16 to 20 pairs, rather irregular in angle and spacing, usually at from 70° to 80° with the midrib, and curving gently to and along the margin, raised beneath; secondary nerves many, between the main-nerves and similar to them; reticulations very oblique, sometimes nearly parallel to the nerves, raised beneath; petiole 4 to 6 in. long, bordered by the decurrent margins of the blade. Cymes axillary, sessile, as long as or up to twice as long as the petioles, dichotomous; branches slender; pedicels 1 in. long; bracteoles minute, acute; buds conoidal at tip, 2 to 3 in. long. Calyx 06 in. long, campanulate, with 5 deep ovate, acute, ciliate lobes. Corolla hypocrateriform; the tube ellipticovoid 15 in. long, mouth much constricted; lobes ovate-falcate, acute, recurved in flower, 15 in. long, margins involute. Stamens near the apex of the tube, included, ovate; filaments short, geniculate. Ovary elliptic-ovoid, glabrous, narrowed into the 075 in. long slender style, which is obconic at top; stigma small, cylindric, rounded at tip.

Berry yellow or greenish-yellow turning to red, ovoid-cordate or nearly globose; 3 to 4 in. in diam.; pericarp thick, coriaceous, smooth. Seeds few, large, embedded in pulp, elliptic, about '6 in. long by '4 in. broad; testa membranous; cotyledons plano-convex, thick; radicle minute. Chilocarpus flavescens, Kew Gard. Report, 1880, 47. Urnularia flavescens, Stapf in Hook. Ic. Pl. t. 2711, p. 2.

Perak: King's Collector 7286, 7848. Province Wellesley: Ridley 9389. Malacca: Hervey. Singapore: Murton 120; Ridley 6936, 10123; Cantley 52.

We do not propose to separate "Urnularia" from "Willughbeia." Dr. Stapf has kindly explained that he proposed the new genus under the belief that the seeds were albuminous, which, however, he finds now they are not. The mistake arose from a fruit of another Apocynacea, presumably one-half of a follicle of a species of Rejoua, having been mixed up with the flowering specimens of Urnularia ovatifolia.

9. WILLUGHBEIA RUFESCENS, Dyer in Herb. Kew.; Hook. f. Fl. Br. Ind. III. 626 (1882). A large climbing shrub, glabrous; branches dark grevish-brown, swollen at the nodes, obtusely angled, rough; branchlets cinereous-brown when dry, slender. Leaves coriaceous; elliptic-oblong or -lanceolate, very obtusely short-acuminate at apex, cuneate or rounded, often unequally, at base; glabrous on both surfaces, olivaceousbrown and shining above, dull and reddish-brown beneath; margins recurved; 2 to 4 in. long, 5 to 1.5 in. broad; midrib stout, deeply impressed above, raised beneath; main nerves 20 to 25 or more (the apex ones very close and difficult to count) pairs, at an angle of about 75° with the midrib, straight to near the margin where they curve; secondary nerves many, between the main nerves and similar to them, reticulations oblique; all faint on the upper, rather thick and distinct on the lower surface; petiole 2 to 3 in. long. Cymes axillary, sessile, slightly longer than the petioles with few slender short lax few-flowered branches; bracteoles minute, ovate; pedicels 2 in. long, slender; buds linear-oblong, 25 in. long; flowers yellow. Calyx under 1 in. long, deeply lobed; lobes broadly ovate, subacute, ciliate on the margins. Corolla hypocrateriform; tube ellipsoid, glabrous, 15 in. long; lobes narrowly oblong, obtuse, erect when open, 15 in. long, margins incurved. Anthers ovate, apiculate; filaments geniculate, slender, inserted below the middle of the tube. Ovary broadly ovoid, as long as the calyx; style short, '06 in. long, ending in an obconic top; stigma narrow, cylindric. Berry (immature) globose, 1.5 to 2 in. in diam.; pericarp thick, leathery, smooth. Seeds embedded in pulp.

Perak: Scortechini. Malacca: Maingay (K.D.) 1092; Hervey. Province Wellesley: at Krian, Ridley 9389. Singapore: Ridley 3996, 6023, 6047, 6143.—Distrib. Sumatra (Forbes 3232).

2. CHILOCARPUS, Blume.

Sarmentose or scandent woody shrubs. Leaves coriaceous or chartaceous, opposite, petiolate, penninerved, the main-nerves numerous. nearly at right angles to the midrib, sometimes indistinct. Flowers usually small, slender, in dense axillary cymes or terminal or axillary trichotomous panicles; pedicels enlarged in fruit. Calyx 5-partite, the lobes short, glands none. Corolla hypocrateriform; the tube cylindric, slightly dilated at the insertion of the stamens, the throat without scales; lobes 5, short, broad, twisted, overlapping to the left, twisted to the right. Stamens inserted at or below the middle of the tube. included; anthers lanceolate, acute, the cells rounded at the base, inappendiculate. Disk none. Ovary entire, 1-celled, with 2 parietal prominent multi-ovular placentas; style short; stigma conical or ovoid, faintly bifid; ovules 2- or many-seriate on each placenta. Fruit a fleshy berry, ultimately bivalved, dehiscent; pericarp thick. embedded in pulp with fibrous and corky arils, numerous, compressed or thick, often grooved near the hilum; either with thin testa and horny albumen, or with thick granular testa and thin albumen, albumen equable or ruminate; cotyledons flat sub-foliaceous, broad or narrow; radicle elongate, terete.—DISTRIB. India, Burma, Malay Archipelago and Peninsula, and tropical Australia; species about 16 to 18.

The nature of the corky processes which we call "arils" above is a little difficult to understand. They are well shown in the excellent figure of the fruit of C. suaveolens, Bl., in t. liii in Blume Mus. Bot. Lugd.-Bat. I., but the author gives no explanation of his drawings. We prefer to use the word aril, as it seems to us the most explanatory. When the fruits and seeds of all the species are known, it may be possible to make two genera, or, at any rate, two subgenera, according to the testa and albumen.

Flowers small, corolla-tube under '3 in. long (where known); leaves medium-sized or small, nerves not very prominent:—

Flowers in terminal or axillary cymes as long as or longer than the leaves:—

Flower-pedicels without imbricate bracteoles, only bracts at the bases of the pedicels; secondary nerves of the leaves recurrently branched:—

Leaves 2.25 to 3 in. long, thinly coriaceous; main nerves many, easily visible when dry; peduncles under 1 in. long; seeds with thin testa and horny albumen

Leaves 3 to 5 in. long, chartaceous; main nerves many, not easily seen when dry; peduncles over 1.5 in. long; seeds not known

Flower-pedicels with many imbricate bracteoles; seeds with the testa thick and granular and the albumen thin; secondary nerves of the leaves not recurrently branched... 1. C. atro-viridis.

2. C. embelioides.

.. 3. C. decipiens.

Flowers in axillary cymes much shorter than the leaves; flower-pedicels with imbricate bracteoles:-

Leaves coriaceous, more or less obovate:-

Cymes nearly sessile: leaves obtuse at the apex; fruitpericarp usually tubercled without; seeds with thin testa and horny albumen 4. C. enervis.

Cymes on peduncles nearly 5 in. long; leaves shortly apiculate; fruit unknown:-

Leaves coriaceous, upper surface dull brown, lower pale when dry; main nerves nearly at right angles to the midrib; corolla-lobes rhomboid-falcate ... Leaves chartaceo-coriaceous, upper surface nearly black shining, lower dark greyish-brown when dry; main

nerves at about 75° with the midrib; corolla-lobes linear-falcate

Leaves scarcely coriaceous, oblong-lanceolate; fruit 2 to 2.5 in. long, about 1 in. broad; seeds with granular testa and thin fleshy albumen

Flowers rather large, corolla-tube .7 to 1 in. long; leaves large, nerves very prominent; seeds with thin testa and horny albumen

.. 5. C. Cantleyi.

6. C. nigrescens.

7. C. minutiflorus.

.. 8. C. costatus.

1. CHILOCARPUS ATRO-VIRIDIS, Blume Mus. Bot. Lugd.-Bat. I. 153 (1850). A glabrous slender climbing shrub; young branches not much thicker than a crow-quill, pale brown, terete, sparsely lenticellate, swollen at the nodes. Leaves thinly coriaceous; narrowly ellipticoblong or -lanceolate, shortly and bluntly caudate-acuminate at apex, cuneate at base; glabrous on both surfaces, dull when dry, the upper pale brown, the lower yellowish, puncticulate; margins thinly cartilaginous, slightly recurved, crispate; 2.25 to 3 in. and even 5 in. long, ·5 to 1·25 in., even 1·75 in., broad; midrib prominent, impressed above; main nerves very numerous, parallel, irregularly spaced, about 25 to 30 pairs; at an angle of about 75° with the midrib, straight to the margin to meet an intramarginal looped nerve very close to it (under .05 in.); secondary nerves very many, between the main nerves, recurrent from the marginal nerve and branched backwards, the branches forming the only visible reticulations; petiole 3 to 4 in. long, slender. Cymes very slender, terminal and axillary, reaching 2 to 4 in. in length, trichotomous; peduncles 5 to 1 in. long, flattened; branch peduncles slender, nearly as long; ultimate cymules corymbose or subumbellate; pedicels slender, ·1 to ·15 in. long; bracts leafy, caducous, one or two always at the base of each pedicel minute and scarious; buds clavate, 2 in. long, tip globose; flowers deep yellow. Calyx campanulate, under 1 in. long; lobes ovate-obtuse, margins hyaline. Corolla-tube short, 1 to 15 in. long, dilated in the middle opposite the stamens, glabrous except a ring of hair within below the stamens; lobes 1 in. long, falcate, broadly notched on one side, recurved when open, acute at tip. Anthers very small, under '05 in. long; filaments scarcely any, pubescent. Ovary conoidal; style slender '05 in. long; stigma oblong, apiculate; ovules many. Berry ovoid, 1.75 in. long, 1.25 in. in diam., dehiscing in 2 concave valves; pericarp thick, hard, woody, smooth and yellow without. Seeds numerous, black, '35 in. long, '3 in. broad, oblate-globose, deeply grooved at the hilum, about one-third surrounded by an aril consisting of yellow angular corky masses and a tuft of minute net-like fibres; testa shining, thin, granular; albumen thick, horny; cotyledons ovate, obtuse, somewhat cordate, flat, '225 in. long; radicle slender, '15 in. long. Miq. Fl. Ind. Bat. II. 393; Hook. f. Fl. Br. Ind. III. 626. Hunteria? atro-viridis, Wall. Cat. 1614; A. DC. Prodr. VIII. 351. Winchia atro-viridis, Kurz For. Fl. II. 170.

PERAK: on Maxwell's Hill, Scortechini 321; at 2,500 to 3,000 feet, King's Collector 6303, 8317. Selangor: at Batang Barjuntai, Ridley 7563; at Kent Estate 8557 (flowers white).—DISTRIB. Tavoy, Mergui.

We do not quote "Malabar" in the distribution because we think that Chilocarpus malabaricus, Bedd. Ic. Pl. Ind. Or. t. 175, is probably distinct from C. atro-viridis.

2. CHILOCARPUS EMBELIOIDES, King & Gamble, n. sp. A climbing shrub; branchlets slender, pale dull brown, almost smooth. Leaves chartaceous; elliptic-oblong, shortly acuminate at apex, narrowed somewhat unequally at base; glabrous on both surfaces and dull, the upper olivaceous when dry; margins pale, thin, crispate; 3 to 5 in. long, 1.25 to 2 in. broad; midrib slender, prominent on the lower, somewhat impressed on the upper, surface; main nerves 24 to 26 pairs, very slender, at an angle of 70° with the midrib, straight, meeting close to the margin a slender faint intramarginal nerve; secondary nerves alternate with the main nerves and joining both the intramarginal nerve and midrib, branched recurrently; reticulations obscure; petiole ·2 to ·4 in. long, slender, slightly rugose. Cymes axillary, lax, manyflowered, nearly as long as the leaves; peduncles slender, 1.5 to 1.75 in. long; branches trichotomous slender, about 1 in. long; ultimate cymules subumbellate; pedicels slender 15 in. long; bracts very small, ovate, acute, at the bases of the rachis-branches and pedicels; buds very short, clavate, tip globose. Calyx campanulate, 05 in. long; lobes very small, rounded, with hyaline, ciliate margins. Corolla-tube cylindric, 1 in. long, slightly constricted at the base and the naked throat, glabrous except for a ring of white villous hairs below the stamens; lobes broad, ovate-falcate, acute, 05 to 1 in. long. Stamens inserted a little above the middle of the tube; anthers lanceolate, apiculate; filaments very short. Ovary conical, attenuated into a short style just reaching the

stamens; stigma conical. Berry (immature) globular, smooth when fresh, wrinkled when dry. Seeds embedded in pulp.

PERAK: at Haram, Scortechini 711.

3. CHILOCARPUS DECIPIENS, Hook. f. in Fl. Br. Ind. III. 627 (1882). A glabrous slender climbing shrub; young branches twice as thick as a crow-quill, terete, dull brown when dry, with numerous elongate pale lenticels, swollen at the nodes. Leaves thinly coriaceous: narrowly elliptic-oblong or -lanceolate, obtusely and often obliquely long acuminate at apex, cuneate at base; glabrous on both surfaces and olivaceousbrown, the lower paler and minutely dotted; margins slightly recurved, crispate; 3 to 3.5 in. long, 1 to 1.5 in. broad; midrib prominent, pale, channelled above; main nerves 20 to 25 pairs, slender, parallel, at about 75° to 80° with the midrib, straight to the margin, close to which they join an intramarginal nerve, visible on both surfaces; secondary nerves many, usually alternate with the main nerves, also running to the intramarginal one, occasionally branched, but not recurrently; petiole slender, 25 in. long. Cymes terminal and axillary, 2 to 3-chotomous, forming a terminal leafy panicle up to 9 in. long and 6 in. broad; main peduncles 1 to 1.25 in. long, successive branches gradually shorter; ultimate cymules subumbellate; pedicels stout, covered with minute bracteoles spirally arranged, up to 2 in. long; bracts leafy caducous, those at the bases of the branches and pedicels ovate acute, sheathing, with pale margins; flowers not known. Berry linear-oblong, cylindric, 2.5 in. long by nearly 1 in. broad, on a stout many-bracteolate pedicel and calvx of ovate acute lobes, splitting when ripe: pericarp woody, minutely granular, green when fresh, reddishbrown when dry, nearly 1 in. thick. Seeds of various shapes, about ·5 in. long; partly enclosed in a corky aril with fibres at its base; testa granular, deeply furrowed as is the thin fleshy albumen; cotyledons flat, nearly orbicular, 15 in. long; radicle 1 in. long.

PERAK: at Ulu Bubong, in dense jungle at 300 to 600 feet, King's Collector 10017, 10268. MALACCA: Maingay (K.D.) 1043, 1060. SELANGOR: on Kent Estate, Ridley 8557.

4. Chilocarpus enervis, Hook f. Fl. Br. Ind. III. 626 (1882). A stout woody glabrous climbing shrub; branchlets as thick as or thinner than a goose-quill, pale brown when dry, obtusely angled, the nodes raised and marked by a ridge; terminal buds resinous. Leaves coriaceous; narrowly obovate or oblanceolate, rounded or very briefly apiculate or sometimes shallowly emarginate at apex, long cuneate at base; both surfaces shining, the lower very pale when dry and often minutely puncticulate; the margin slightly cartilaginous, recurved; 3 to 5 in. long, 1.25 to 2 in. broad; midrib stout, prominent beneath,

channelled above; main nerves numerous, about 25 to 30 pairs, at about 80° with the midrib, faint on the upper surface, invisible on the lower: secondary nerves nearly as many as and between the main nerves. reticulations not visible; petiole 5 to 75 in. long, usually Cumes small, in dense axillary clusters, shorter than the petiole; pedicels very short, thick, spirally corrugated by the scars of fallen bracteoles, very much thickened in fruit; buds clavate, the tip globose; flowers minute, white. Calyx 05 in. long or less, deeply divided in 5 ovate, hyaline, puberulous, rounded lobes. cylindric, slender, 3 in. long, inflated about one-third of the way up, opposite the stamens; throat naked; lobes obliquely falcate, apiculate on one side, 1 to 15 in. long. Anthers lanceolate, very small, rounded at the base; filaments very short. Ovary ovate, acuminate; stigma small, conoidal; placentas prominent. Berry orange-coloured, ellipsoid or obovoid, 1.5 to 2 in. long and 1 to 1.5 in. broad; pericarp thick, fleshy, smooth or much corrugated and tubercled externally, woody, dividing into two concave or flat valves. Seeds embedded in a fibrous pulp and enclosed in a pale orange corky lobed arillus on one side. 4 in. long, oblong or ovoid, sometimes flattened at the ends, deeply grooved at the hilum; testa black, shining, thin; albumen horny, thick; cotyledons flat, orbicular-cordate, 2 in. in diameter: radicle 1 in. long.

Perak: at Thaipeng, Kalan Tujor, &c., Wray 593, 1118, 1804, 4026; Scortechini 189; King's Collector 3203, 3786, 7532, 8328, at 100 to 500 feet; Cantley 25. Malacca: Maingay (K.D.) 1044.

5. CHILOCARPUS CANTLEYI, King & Gamble, n. sp. A glabrous climbing shrub; young branches as thick as a goose-quill, smooth, at first yellowish afterwards dark brown, obtusely angled, raised at the nodes and ridged. Leaves coriaceous; elliptic or oblanceolate, the apex obtuse or with a short blunt apiculus, long-attenuate at base; both surfaces dull when dry, the upper dark greenish-brown, the lower very pale greenishvellow when fresh, puncticulate; margins slightly recurved; 3.5 to 4 in. long, 1.25 to 1.5 in. broad; midrib thick, channelled above, broad and conspicuous beneath; main nerves extremely faint on the upper surface when dry, invisible on the lower, apparently about 30 pairs at nearly right angles with the midrib and with many intermediate secondary nerves; petiole about 6 in. long, channelled above. Cymes axillary, glabrous, on stout somewhat flattened peduncles 4 to 5 in. long, many-(about 20-) flowered, few-branched; pedicels 1 in. long, with many obtuse imbricate bracteoles which are caducous and leave rough pits behind; buds clavate, the tip obtuse; flowers yellow. Calyx 075 to ·1 in. long, lobes elliptic-rotund, thick with hyaline margins. Corollatube cylindric, 2 in. long, dilated slightly below the middle opposite the

stamens, constricted at throat; glabrous within except at the base; lobes '15 to '2 in. long, broadly rhomboid-falcate, plicate in bud. Stamens in the dilated part of the tube; anthers lanceolate, rounded at base, '05 in. long; filaments slender, pubescent below, as long as anthers. Ovary ovate, compressed, tapering to a '075 in. long style with short subglobular stigma. Fruit not known.

Perak: near Ulu Kerling, 500 to 700 feet, King's Collector 8823; swamps in lower Perak, Cantley 227. Selangor: at Kwala Lumpor, Ridley 2839; Curtis 2354.

Curtis's specimen has more narrowly lanceolate leaves and a rather longer apiculus, with more slender branches, and has also, with Ridley's specimen, shorter peduncles to the inflorescence, but they seem both to be correctly this species, which comes very near to *C. enervis*, but has much less slender flowers and larger inflorescence.

6. CHILOCARPUS NIGRESCENS, King & Gamble, n. sp. A glabrous climbing (?) shrub; branchlets rather stout, nearly black, terete. the nodes somewhat swollen and usually ridged. Leaves chartaceocoriaceous; elliptic-oblong or -oblanceolate, shortly and abruptly bluntacuminate at apex, cuneate at base, often from nearly the middle of the blade; upper surface shining, nearly black when dry, lower a little paler and grevish-brown, minutely puncticulate; margins slightly recurved; 3 to 5 in. long, 1.5 to 2 in. broad; midrib rather slender, slightly impressed above, raised beneath; main nerves 12 to 16 pairs at an angle of about 75° with the midrib, nearly straight to meet an arching intramarginal nerve at about 1 in. from the edge, faint on both surfaces; secondary nerves many, often recurrently branched; reticulations obscure; petiole 5 to 6 in. long. Cymes axillary, up to 1.5 in. long, more or less pyramidal, crowded; peduncle stout, flattened, 3 to ·5 in. long; branches 3-chotomous, short; cymules subumbellate; pedicels about 15 in. long, densely strobilate with imbricate, rounded, palemargined bracteoles; the bracts at the bases of the branches acute and sheathing; buds clavate, 4 in. long, the tip globose. Calyx campanulate, 05 to 075 in. long; lobes rather deep, broadly ovate, rounded, minutely ciliate. Corolla-tube narrowly cylindric, dilated at about one-third of the height from the base opposite the stamens, contracted at the naked mouth, glabrous without, slightly puberulous below the stamens within; lobes linear-falcate, acuminate, much twisted, about ·2 in. long. Stamens inserted below the middle of the tube; anthers lanceolate, apiculate, rounded at base, '05 in. long, as long as the slender curved filaments. Ovary conoidal, glabrous, style slender, obconic above; stigma conical. Berry not known.

Perak: on Government Hill and West Hill, Curtis 1040, 1121, 3086.

The same number, "Curtis 1040," is quoted by D. Oliver in Hook. Icon. t. 1758 (1888) as the type of Melodinus coriaceus, Oliver, but all our specimens have more or less the imbricated bracteoles of Chilocarpus, and are destitute of scales in the throat of the corolla, or of laciniæ to its lobes. A comparison of the specimens of Melodinus coriaceus in the Kew Herbarium shows clearly that two species have been given the same number, but that the resemblance is superficial only. The real M. coriaceus has the leaves pale brown, and not black, when dry.

7. CHILOCARPUS MINUTIFLORUS, King & Gamble, n. sp. A glabrous climbing shrub; young branches thicker than a crow-quill, obtusely angled, striate, with thin scaly bark, pale when dry; nodes swollen. ioined by a ridge. Leaves thinly coriaceous, elliptic or oblong-lanceolate, shortly obtusely-acuminate at apex, narrowed or almost rounded at base: upper surface green, lower waxy-white when fresh, both pale greenish-yellow when dry; margins slightly recurved; 2 to 2.5 in. long. ·75 to 1·25 in. broad; midrib slender, prominent beneath; main nerves 9 to 12 pairs, at an angle of about 65° with the midrib, straight, joined at about 05 in. from the margin in an obscure intramarginal nerve. faint on both surfaces or sometimes not distinguishable: secondary nerves present, but, like the reticulations, not easily visible; petiole slender, 15 to 2 in. long. Cymes axillary, few-flowered, scarcely exceeding the petioles; peduncles very short, as are the branches and pedicels, which are sometimes enlarged and bear many imbricate bracteoles; bracts ovate-acute, sheathing; buds clavate, 15 in. long, the tip globose; flowers white or yellow. Calyx campanulate, 05 in. long, lobes very small. Corolla-tube inflated in the middle opposite the stamens, constricted above and below. 1 in, long, glabrous except a ring of hairs under the stamens within: lobes ovate falcate, acuminate. about 2 in. long. Anthers ovate-lanceolate, 05 in. long, nearly sessile. Ovary ovoid, tapering into a short style with conical tip. Berry on a stout pedicel, narrowly obovoid or pyriform, surmounted by a mamillate apex, splitting into 2 valves marked by slight vertical ridges; 2 to 2.5 in. long, .75 to 1.25 in. broad; pericarp thick, woody, dull green with specks when fresh, yellowish when dry. Seeds numerous, oblong, angular, 25 in. long, embedded in pulp and partly enclosed in a papery aril, sulcate at the hilum; testa granular, dark brown; albumen thin, fleshy; cotyledons ovate.

PERAK: King's Collector 5368, 5494, 7550, in dense jungle.

No. 5368 has broader leaves than the rest and pedicels with imbricating bracteoles, which the others only show a tendency to, but we see no reason to keep it separate.

8. CHILOCARPUS COSTATUS, Miq. Fl. Ind. Bat. II. 393 (1856). stout climbing shrub; young branches as thick as a goose-quill, shining and purplish-brown when dry, sometimes obtusely angular, nodes swollen. Leaves chartaceous; elliptic or elliptic-oblong, shortly and very obtusely acuminate at apex, attenuate at base or sometimes rounded; both surfaces glabrous, upper shining, when dry the upper greenish- or dull purplish-brown, the lower yellowish-brown; margins recurved: 4 to 8 in. long, 2 to 3.5 in. broad; midrib stout, broad above and impressed, sharply angled beneath when dry; main nerves 12 to 20 pairs, nearly parallel, very conspicuous, impressed on the upper, raised on the lower surface, starting at an angle of from 65° to 75° with the midrib and gradually curving to join in a prominent intramarginal slightly looped nerve 05 to 1 in. from the margin; secondary nerves many, usually alternate with the main nerves but sometimes at irregular angles with the midrib, recurrent from the intramarginal nerve and branching backwards; reticulations few, oblique, inconspicuous; petiole ·5 to 1 in. long, bordered by the decurrent margins of the blade. Cumes axillary, puberulous, trichotomous, reaching about 3 in. in length and breadth, many-flowered, apparently whorled; peduncles 5 to 1.5 in. long, stout, flattened: branch peduncles 3 to 6 in, long, these again branched; ultimate cymules subumbellate; pedicels 1 to 15 in. long; bracts caducous; bracteoles ovate acuminate, grey-puberulous, the margins hyaline, at the bases of the pedicels; buds clavate with globose tips, .75 in. long; flowers yellowish. Calyx campanulate, .075 in. long; lobes ovate, rounded, margins hyaline minutely ciliate. Corolla-tube very slender, 7 to 1 in. long, dilated a little above the base opposite the stamens, pubescent at the base within, otherwise glabrous; lobes ovatelanceolate, acuminate, reaching 5 in. long and about 25 in. broad. Anthers lanceolate, 075 in. long, cells rounded at base; filaments slender, as long as anthers, villous at base. Ovary ovate, acuminate, compressed, smooth, glabrous; style slender, 1 in. long; stigma ovoid. apiculate. Berry large, ovoid when young, elliptic when ripe, with a smooth boss at the apex, and flattened base; 2.5 to 3 in. long, 1.5 to 2 in. broad; pericarp thick, orange-yellow, smooth. Seeds embedded in fibrous pulp and half surrounded by a fleshy yellow arillus, oblongsubquadrate, deeply channelled at the hilum; testa thin, brown; albumen thick, horny; cotyledons ovate-orbicular, flat; radicle short. C. Maingayi, Dyer; Hook. f. Fl. Br. Ind. III. 627.

Penang: at Ayer Etam, Curtis 475. Perak: at Sungie Larút, Wray 2428; Scortechini; King's Collector 3261, 5264, 10848. Pahang: Ridley in Trans. Linn. Soc. Ser. 2, III. 319 (C. Maingayi). Malacca: Maingay (K.D.) 1045, 1046; Curtis 3479. Selangor: Ridley 2726.

We are unable to separate *C. Maingayi* from *C. costatus*. Teysmann's specimen of the latter in the Kew Herbarium has only immature flower-buds, rather smaller than the buds of *C. Maingayi*, but some of our specimens have them in quite as immature a stage. Curtis says it gives a very white rubber.

3. LEUCONOTIS, Jack.

Erect or climbing shrubs. Leaves opposite, distantly penninerved. Flowers in pedunculate axillary cymes, 4-merous. Calyx 4-lobed or -partite, thickened at the base, eglandular or minutely glandular within. Corolla hypocrateriform; tube slightly dilated in the middle opposite the stamens, throat naked; lobes 4, short, overlapping to the left. Stamens 4, included in the tube; anthers linear-lanceolate, the cells rounded at the base. Disk none. Ovary 2-celled; style short; stigma thickened, with a very short bifid apiculus; ovules 2 to 3 in each cell, axile, laterally affixed. Fruit an ovoid or globose berry, pulpy within. Seeds 1 to 6, ovoid-oblong; testa membranous; albumen none; cotyledons thick fleshy, the inner surfaces irregular; radicle short. — DISTRIB. Malay Peninsula and Archipelago; about 6 species.

Calyx 4-partite, lobes long linear; intramarginal nerve of leaves very prominent; ovules 3 in each cell; seeds up to 6 . . 1. L. eugenifolius. Calyx 4-lobed, lobes short rounded; intramarginal nerve obscure; ovules 2 in each cell; seeds usually 2:—

Corolla-tube 25 in. long; peduncles very stout; calyx and bracteoles very thick fleshy; berry obovoid . . . 2. L. Maingayi. Corolla-tube 3 to 4 in. long; peduncles rather thick; calyx and bracteoles moderately large and thick; berry ellipsoid . 3. L. Griffithii.

1. Leuconotis eugenifolius, A. DC. Prodr. VIII. 331 (1844). A small erect or climbing shrub; branchlets thinner than a goose-quill, dark-rusty-puberulous at first, afterwards glabrous, obscurely angled. Leaves chartaceous; elliptic-oblong, sometimes oblanceolate, abruptly and often obliquely obtuse-caudate-acuminate at apex, rounded at base or sometimes slightly cuneate; upper surface dull olivaceous-brown, lower surface pale yellowish-brown, minutely punctate and rustypuberulous on the nerves; 2.5 to 4.5 in. long, 1 to 2 in. broad; main nerves 8 to 10 pairs, very prominent on the lower surface, at right angles to the midrib, straight to join in a conspicuous intramarginal nerve at nearly 1 in from the edge, the said nerve joining the midrib below the acumen; secondary nerves usually 1 or 2 between the main nerves, reticulations obscure; petiole slender, 3 to 5 in. long, rustypubescent. Cymes 1 to 1.5 in. long, erect, rusty-pubescent, usually about 6- to 12-flowered; peduncle 5 in. long; branches 3, the side ones few-flowered, the mid one usually again branched; pedicels about 2 to

·3 in. long; bracts leafy, linear or spathulate, ·5 to 1 in. long; bracteoles linear, obtuse at tip, similar to calvx-lobes; buds clavate, the tip ovoid: flowers vellowish. Calyx-tube very short; lobes linear, 2 in. long. pubescent and with few hispid hairs near the obtuse tip, slightly recurved; glands few, minute. Corolla-tube 3 to 4 in. long, glabrous except near the base inside; lobes 15 to 2 in. in diameter, ovatecordate, densely pubescent, the margins incurved. Anthers 4, linearlanceolate, apiculate, 15 in. long; filaments 05 in. long, slender, decurrent in the tube. Ovary conoidal, more or less 4-angled, glabrous or pubescent; style slender, 125 in. long; stigma globose, apiculus bifid; cells 2, oyules 3 in each cell. Berry ovoid, about 1.25 to 1.5 in. long and 1 in. in diameter; pericarp leathery, shining without, wrinkled when dry, pulp very scanty, septum thin. Seeds up to 6, ovoid-oblong, ·6 in. long by ·35 in. broad, slightly grooved at the hilum; testa membranous, brown; cotyledons very thick, unequal. Mig. Fl. Ind. Bat. II. 397; Hook. f. Fl. Br. Ind. III. 628. L. cuspidata, Blume Mus. Bot. Lugd.-Bat. I. 112: Mig. l.c. 398. Melodinus? eugenifolius, Wall. Cat. 1616.

Kedah: Cantley 230. Penang: Wallich 1616; Curtis 1061; King's Collector 996a, 1452. Perak: Curtis; Wray 629, 630, 3141, 4248; Scortechini 1281. Singapore: Ridley 2724. — Distrib. Sumatra (Teysmann 4053; Beccari 844; Curtis 3551; Forbes 1586, 2725), Borneo (Burbidge, Beccari 3246).

2. Leuconotis Maingayi, Dver in Herb. Kew.; Hook. f. Fl. Br. Ind. III. 628 (1882). A climbing shrub; branchlets stout, nearly as thick as a goose-quill, nearly black when dry, obtusely quadrangular, the nodes swollen and crossed by a slender ridge joining the bases of the petioles. Leaves opposite or in whorls of 3, coriaceous; ellipticoblong, abruptly and obtusely caudate-acuminate at apex, attenuately rounded at base; shining on the upper surface and very dark brown when dry, paler and dull on the lower; margins recurved; 3 to 5 in. long, 1.5 to 2 in. broad; midrib strong, channelled above, raised beneath; main nerves 6 to 10 pairs, the lowest very near the margin and starting the rather obscure intramarginal looped nerve, to which the others, which start from the midrib at about 60°, gradually curve; secondary nerves none or very few; reticulations obliquely transverse, rather prominent; petiole 1.25 in. long, channelled above by the decurrent margins of the blade, which become connivent. Cymes very stout, about as long as the petiole, about 15- to 20-flowered; peduncle very thick, flattened, 25 to 5 in. long and 15 to 25 in. broad, much enlarging in fruit; branches about 4, these again 2-chotomously branched, very stout, as are the very short (up to 15 in. long) pedicels; bracts ovate-acute, clasping the branches and bases of the pedicels; buds clavate, the tip conical. Calyx-tube very short, fleshy; lobes 4, ovate, rounded, the two outer broader and shorter than the two inner, which are ·2 in. long, all glabrous but very slightly ciliate; glands very many, very minute, in bud scarcely more than papillæ. Corolla-tube cylindric, ·25 in. long, puberulous at the base within; lobes 4, broadly ovate, recurved, thickly puberulous, the margins incurved slightly. Stamens in the upper half of the tube; anthers lanceolate, apiculate, ·125 in. long; filaments short, broad. Ovary somewhat depressed, 4-grooved, tapering to a broad ·1 in. style; stigma rounded with a short apiculus; cells 2, ovules 2 in each cell. Berry obovoid, 1·5 to 1·75 in. long by about 1 in. in diam.; pericarp thick, smooth and shining without. Seeds about 3, oblong, somewhat flattened, ·75 in long by ·5 in. broad and ·25 in. thick, dark brown; testa very membranous; cotyledons thick, fleshy; radicle cylindric, about ·15 to ·2 in. long.

SINGAPORE: Maingay (K.D.) 935; Ridley 2826, 3710, 8908.

3. Leuconotis Griffithii, Hook. f. in Fl. Br. Ind. III. 628 (1882). A glabrous climbing shrub; branchlets stout, as thick as a goose-quill, obscurely angled, dark brown when dry with a few pale lenticels, ultimate ones quadrangular. Leaves coriaceous; elliptic-oblong, obtusely and abruptly short acuminate at apex, rounded or slightly cuneate at base; upper surface shining, pale olivaceous-brown when dry, lower dull and paler chocolate-brown, often glandular-dotted; margins recurved; 3.5 to 5.5 in. long, 1.5 to 2.25 in. broad; midrib slender, impressed above, sharply prominent beneath; main nerves 5 to 7 pairs, starting at an angle of 70° with the midrib and curving upwards to meet in a faint looped intramarginal nerve, impressed above, raised beneath, fairly conspicuous when dry; secondary nerves few or none; reticulations obliquely transverse; petiole 5 to 75 in. long, bordered by the decurrent margins of the blade, which are connivent. Cymes axillary, erect, as long as the petiole; peduncle 5 in. long, somewhat flattened, stout; branches 3 at first, again subdividing, crowded; pedicels quadrangular, ·1 to ·2 in. long; bracts ovate, acute, sheathing the bases of the joints and pedicels; buds clavate, the tip oblong; flowers yellow. Calyx 1 in. long, thick at base; lobes 4, ciliate, the two outer ovate-acute, the 2 inner oblong rounded, all with many small glands at the base within and 1 to 2 fairly large ones. Corolla-tube cylindric, 3 to 4 in. long, glabrous except the puberulous lower third inside; lobes broad, blunt, ovate, 15 to 2 in. long. Stamens occupying the upper half of the tube; filaments short, broad; anthers linear-lanceolate, apiculate, 125 in. long. Ovary conical, 4-angled, glabrous, with an angled style and acute stigma; cells 2-ovuled. Berry ellipsoid, 1.5 in. long, 1 in. in diameter; pericarp leathery, smooth, shining. Seeds usually 2 only, on a thin

septum and with little pulp, '7 in. long, '4 in. broad; testa membranous; cotyledons very thick, wrinkled on the inner face; radicle small, included between the cotyledons.

Perak: Scortechini 1475; Wray 28, 592, 1366, 4009; King's Collector 2663, 3080; Curtis. Malacca: Griffith; Maingay (K.D.) 1050, 1051. Selangor; Ridley 1963. Singapore: Kurz; T. Anderson 60; Ridley 2735, 9166.

Ridley's specimen from Upper Bukit Mandai, Singapore, has dark rough branchlets, smaller leaves with closer main-nerves and less crowded cymes, but does not seem otherwise to differ, at any rate not sufficiently to warrant its being made a variety.

L. Griffithii is an india-rubber producer, and the product is said to be good, very probably as good as that of the neighbouring L. elasticus, Becc. 'Nelle foreste di Borneo,' pp. 358, 562, fig. 59, and Hook. Ic. Pl. t. 2733.

4. Melodinus, Forst.

Erect or scandent shrubs. Leaves opposite, penninerved, the nerves thin, parallel; reticulations transverse. Flowers in terminal trichotomously paniculate cymes or in axillary and condensed cymes, 5- rarely 4-merous, white or pale pink, often sweet-scented. Calyx 5-partite, eglandular within. Corolla hypocrateriform; tube cylindric, dilated more or less opposite the stamens; the lobes overlapping to the left, entire or fimbriate at the tips; the mouth with thick cleft or lobed scales. Stamens 5 or 4, at or below the middle of the tube; anthers included, oblong-lanceolate, cells rounded at the base; filaments short. Disk none. Ovary 2-celled; style short; stigma thick, bifid; ovules many in each cell, axile. Fruit a globose berry; pericarp coriaceous or hard. Seeds many, embedded in pulp; albumen fleshy; cotyledons thin, ovate, foliaceous; radicle long.—Distrib. India, Malaya, Southern China and Australasia, about 20 species.

Flowers rather large, in terminal panicled cymes; corolla-lobes oblong, rounded, entire (Subgenus I. Eumelodinus) .. 1. Flowers small, in short axillary cymes; corolla-lobes dentate at tip, often fimbriate (Subgenus II. Pleurophacelus):—

1. M. monogynus.

Leaves chartaceous, both surfaces brown and nearly similar in colour, the lower only slightly paler than the upper:—

2. M. orientalis.

3. M. micranthus.

Leaves narrow, reaching only 1.25 in. broad, main nerves 18 to 22 pairs; cymes few-flowered ...

.. 4. M. citriformis ves

Cymes longer than the petiole, '75 to 1 in. long; leaves greenish-brown when dry

.. 5. M. perakensis.

Leaves coriaceous, upper surface olivaceous-brown, shining; lower surface paler and dull; cymes scarcely longer than the petioles; corolla-lobes scarcely bifid, much oblique, fimbriate at tip

6. M. coriaceus.

1. Melodinus monogynus, Roxb. Fl. Ind. II. 56 (1832). A large glabrous climbing shrub; young branches thinner than a goose-quill. smooth, nearly cylindric, dull brown when dry. Leaves chartaceous: oblong or oblong-lanceolate, acuminate at apex, cuneate or rounded at base; glabrous on both surfaces, the upper shining, the lower rather dull and paler brown when dry; margins slightly recurved, somewhat crispate when dry; 4.5 to 6 in. long; 1.5 to 2 in. broad; midrib slender, impressed above, raised beneath; main nerves about 20 pairs, slender, at about an angle of 70° with the midrib, very slightly curved to meet an intramarginal looped nerve close to the edge; secondary nerves many, similar to main nerves but thinner, often forked, sometimes with recurrent branches; reticulations transverse, irregular; all faint on both surfaces; petiole 2 to 3 in. long, rather stout. Cymes terminal, puberulous, reaching 3 in. in length (occasionally more) and 2 to 3 in. in diam.; peduncles 0 to .75 in. long; branches trichotomous; pedicels variable; bracts of the inflorescence and primary branches leafy, caducous, those at the bases of the branches and pedicels ovate, acute bracteoles 1 to 2, small, obtuse, on the pedicel itself; buds elongate, tip oblong, acute; flowers white, fragrant. Calyx campanulate; lobes 5, oblong-orbicular, sometimes emarginate, ciliate, 15 to 2 in. long, the margins hyaline. Corolla-tube cylindric, 5 to 75 in. long, widening upwards, glabrous or slightly puberulous without, densely villous within, above the stamens; lobes oblong-falcate, rounded, 3 to 5 in. long, more or less auricled, each with a 2- to 3-lobed glabrous scale near the base; throat with a corona of 5 bifid villous linear-falcate lobes. Anthers oblong-lanceolate, '06 in. long; filaments slender, short. Ovary rounded; style slender, 1 in. long; stigma thick, cylindric, with a sharp bifid apiculus, very gummy, embraced by the anthers. Berry globose, smooth, pulpy, reaching 3 in. in diam.; pericarp coriaceous, orange-coloured, smooth. Seeds numerous, flattened; integuments 2, outer thick rugose, inner membranous; albumen copious; cotyledons oval. A. DC. Prod. VIII. 329; Wall. Cat. 1603; Wight Ic. t. 394; Bot. Reg. t. 834; Bot. Mag. t. 2527; Hook. f. Fl. Br. Ind. III. 629; Prain Beng. Plants 668. Echaltium piscidium, Wight Ic. t. 472, excl. fig. of fruit. Nerium piscidium, Roxb. Fl. Ind. II. 7, excl. descr. of fruit.

Penang: Maingay (K.D.) 1085. Perak: Curtis 1308.—Distrib. India (Sikkim Himalaya, Cooch Behar, Assam, Khasia Hills and Sylhet); Timor (Forbes 3708). The fruit is edible.

2. Melodinus orientalis, Blume Bijd. 1026 (1826) and Mus. Bot. Lugd.-Bat. I. 155, fig. LII. A large glabrous climbing shrub; branches smooth, rather slender, with nearly black bark; upper branchlets obscurely angled, glabrous. Leaves chartaceous; oblong or ellipticoblong, obtusely acuminate at apex, acute at base and often unequal; glabrous on both surfaces, upper nearly black and shining when dry, lower chocolate-brown and dull; margins slightly undulate-crispate; 3 to 5.5 in. long, 1 to 2.25 in. broad; midrib slender, slightly impressed above, sharply raised beneath; main nerves about 20 to 30 pairs, at from 60° to 70° with the midrib, curving upwards and branching to meet an obscure intramarginal looped nerve quite close to the margin; secondary nerves hardly distinguishable from main nerves, but rather more slender, sometimes with recurrent branches; reticulations irregular, obscure; petiole 3 to 5 in. long, bordered by the decurrent margins of the blade, which are connivent. Cymes axillary, few-(8- to 10-) flowered, crowded, scarcely as long as the petioles; peduncles very short or almost none. stout; bracts ovate-acute, sheathing the branches and the very short (025 in. long) pedicels, which also bear a pair of rounded bracteoles below the calyx; buds clavate, 25 in. long, tip globose; flowers white. Calyx campanulate, thick, 1 in. long; lobes half that length, ovate, rounded, puberulous. Corolla-tube thick, cylindric, 2 in. long, dilated opposite the stamens, contracted above and below, puberulous without, and within below the stamens; lobes short, obliquely ovate, bifid, one branch bicuspidate, plicate in bud; throat with 5 thick fleshy 2-lobed Stamens inserted in the middle of the tube; anthers lanceolate. apiculate, rounded at base; filaments short, slender. Ovary conoidal, ribbed, surmounted by a slender style '05 in. long and obconic above; stigma conical with a bifid apiculus. Berry "large, yellow" (Maingay), "globose, red" (Blume), apparently about 2.5 in. in diameter. Seeds oblong, about 8 in. long and 4 in. broad, testa rugose. Miq. Fl. Ind. Bat. II. 395, t. xxxiv.; A. DC. Prod. VIII. 330; Kurz in Journ. As. Soc. Beng. XLVI. ii. 250, in note; Hook. f. Fl. Br. Ind. III. 629. Hunteria? cuspidata, Wall. Cat. 1609; A. DC. l. c. 350. Alyxia? cuspidata, Wall. Herb. Chilocarpus cuspidatus, Benth. in Gen. Pl. II. 698 (under Hunteria).

Penang: Wallich 1609; Phillips; Maingay (K.D.) 1043/2 (Chilocarpus suaveolens); Curtis 738, 2838. Perak: on Maxwell's hill, 3000 ft. Scortechini 355; at Goping, King's Collector 4530. Distrib. Java, Sumatra (Forbes 1568).

3. Melodinus micranthus, Hook. f. in Fl. Br. Ind. III. 629 (1882). A climbing shrub (apparently); branchlets rather slender, terete, with nearly black bark, uppermost somewhat angular. Leaves chartaceous: oblong-lanceolate, obtusely acuminate at apex, attenuate at base; smooth and shining and dark reddish-brown on both surfaces when dry, the lower rather paler than the upper; margins recurved, slightly undulate; 3 to 6 inches long, 1 to 2.25 in. broad; midrib slender and impressed above, more conspicuous and raised beneath; main nerves 10 to 15 pairs, slender, remote, at an angle of from 50° to 60° with the midrib, and curving slightly upward to an obscure intramarginal nerve just within the edge, impressed above; secondary nerves few; reticulations transverse, oblique; petiole 15 to 25 in. long, slender. Cymes many-flowered, axillary, trichotomous, about 5 in. long; peduncles 2 in. long, rachis angular; bracts very small, ovate-acute, with ciliate hyaline tips; pedicels .05 to .075 in. long, with two bracteoles near the base of the calyx; buds clavate, tip conical-globose, 15 in. long. Calyx .075 in. long; tube about one-third of length; lobes ovate, rounded. Corolla-tube cylindric, dilated a little above the middle, constricted above and below, 125 in. long, pubescent within in a ring below the stamens; lobes short, unequally obtusely 2-lobed, twisted to the right; the base furnished with fleshy bifid scales closing the mouth. Anthers lanceolate, long-apiculate, 05 in. long; filaments very short. Ovary globose; style slender; stigma conical, with a short bifid apiculus. Fruit not seen.

Penang: road to Sungie Penang, Curtis 1053. Malacca: Maingay (K.D.) 1090.

4. Melodinus citriformis, King & Gamble, n. sp. A slender glabrous climbing shrub; young branches rather thicker than a crow-quill, dull brown when dry, with elongate lenticels. Leaves chartaceous; oblonglanceolate, obtusely and often obliquely caudate-acuminate at apex, cuneate at base; both surfaces glabrous, dull olivaceous-brown when dry; margin slightly crispate; 3 to 4 in. long, 1 to 1.25 in. broad; midrib slender; main nerves 18 to 22 pairs, at rather irregular angles but usually at about 70° with the midrib, fairly straight, meeting an intramarginal nerve at less than 05 in. from the margin, faint on both surfaces when dry; secondary nerves many, irregular, alternate with the main nerves, recurrent and forked to form the inconspicuous reticulations; petiole 25 in. long. Cymes axillary, few-flowered, scarcely longer than the petiole; peduncle and pedicels very short, with many ovate obtuse bracteoles, which, however, scarcely imbricate; buds clavate, 2 in. long, tip globose; flowers light yellow. Calyx 05 in. long, campanulate; lobes very short, obtuse, hyaline on the margins. Corollatube cylindric, dilated in the middle rather below the stamens, contracted above and below, glabrous except a ring of hairs within under the stamens, 125 in. long, with 5 lobed fleshy scales closing the throat; lobes angled, falcate, fimbriate at the tip, the tip inflexed when open. Anthers lanceolate, apiculate, '05 in. long; filaments short, pubescent at base. Ovary conoidal, tapering to a short style and oblong conical stigma, with a pale band at its base. Berry ovoid, orange, 3 to 3.5 in. long, 2.5 in. in diameter; pericarp smooth, shining, rather thin. Seeds numerous, embedded in pulp, roughly oblong, '6 in. long, '4 in. broad, with no apparent aril; testa thick, granular, brown, deeply pitted; albumen waxy or fleshy; cotyledons oblong, '125 in. long, flat; radicle thick, cylindrical, '275 in. long.

PERAK: in dense jungle at 500 to 800 feet, near Larút, King's Collector 6525.

5. Melodinus perakensis, King & Gamble, n. sp. A glabrous climbing shrub; young branches thicker than a crow-quill, cinereousbrown, uppermost obscurely quadrangular. Leaves chartaceous; elliptic or elliptic-oblong, shortly and obtusely acuminate at apex, attenuate at base: both surfaces pale greenish-brown when dry, the upper somewhat shining and darker than the lower; margins slightly recurved; 3.5 to 5 in. long, 1.5 to 2 in. broad; midrib slender, slightly impressed above, raised beneath; main nerves slender, 10 to 15 pairs, starting at about 60° with the midrib and curved upwards to and along the margin where they meet, forming a slightly broken wavy obscure intramarginal nerve; secondary nerves few; reticulations irregular, very faint, only the main nerves easily visible; petiole 15 to 2 in., stout. Cymes axillary, ·75 to 1 in. long, lax, sessile; branches and ·1 to ·2 in. long pedicels slender; bracts ovate-acute, in pairs at the branches and below the pedicels with 1 to 2 obtuse bracteoles on the pedicel; buds clavate, ·2 in. long, tips globose; flowers waxy-white. Calyx ·05 in. long, campanulate; lobes broadly ovate, ciliate. Corolla-tube cylindric, slightly inflated in the middle opposite the stamens, narrowed at the throat; lobes oblong-spathulate, spreading, the apex lobed, one lobe fimbriately toothed; a large rounded gland at the base of each lobe, in the throat of the tube. Anthers lanceolate, cordate at base; filaments short, slender. Ovary broadly ovate; style slender; stigma conical with a bifid apiculus. Fruit pyriform, about 2 in. long by 1.5 in. broad; pericarp thin but woody, smooth. Seeds many, roughly triangular, .75 in. long; testa dark brown, rugose, crustaceous, deeply pitted.

PERAK: in open jungle on limestone hills, at 300 to 800 feet, King's Collector 4481, 7031.

6. Melodinus coriaceus, Oliver in Hook. Ic. Pl. t. 1758 (1888).

A large climbing shrub; branchlets as thick as a swan's-quill, dark reddish-brown, rough, uppermost internodes flattened or angled and with vertical lines: nodes raised and with a slight ridge. coriaceous: elliptic or obovate or oblong-oblanceolate, obtuse or very slightly acute at apex, cuneate at base; upper surface olivaceous-brown. shining, lower much paler and dull, grey when dry; margins recurved: 3 to 5 in. long, 1.5 to 2 in. broad; midrib prominent, impressed above. raised beneath; main nerves 13 to 17 pairs, at about 60° to 70° with the midrib, nearly straight to join an obscure intramarginal nerve: secondary nerves recurrent, branching into reticulations, all fairly distinct on the upper, indistinct on the lower surface; petiole 3 to 5 in. long, channelled above. Cymes axillary, sessile, as long as or slightly longer than the petioles, many-flowered; rachis angular; bracteoles ovate, acute, ciliate; pedicels stout, 05 in, long, much enlarged in fruit: buds clavate, with globose tip, 25 in. long. Calyx 05 to 075 in. long; lobes half the length, ovate, acute, ciliate. Corolla-tube cylindric, constricted at the mouth and near the base, dilated between, opposite the stamens, pubescent within in a ring below the stamens, glabrous without, mouth furnished with 5 2-lobulate fleshy appendages which nearly close it; lobes ovate, falcate, very oblique, the tips fimbriate-dentate turned to the right. Anthers near the top of the tube, sagittate, apiculate. 06 in. long; filaments short. Ovary globose, style slender; stigma conical, with a short bifid apiculus, very gummy. Berry ovoid or globose, 1.5 to 2.5 in. in diam.; pericarp yellowish, shining, tubercular. Seeds many, of irregular shapes, usually ovate pyriform; testa granular, rugose, much pitted; albumen waxy, deeply pitted by the ridges of the testa; cotyledons small, oblong, 125 in. long; radicle cylindrical, 25 in. long. Alyxia ? coriacea, Wall. Cat. 9065, and in Roxb. Fl. Ind. ed. Carey & Wall. II. 540; Hook. f. Fl. Br. Ind. III. 635. Hunteria? coriacea. Wall. Cat. 1610.

Penang: Wallich 1610, 9065; at Chalet, 1000 feet, Curtis 1040. Perak: open jungle near Larút, King's Collector 7499; Waterfall Hill, Wray 2074.

Tribe II.—Plumerieæ.
Subtribe 1.—Rauwolfiinæ.
5. Alyxia, Br.

Shrubs, sometimes scandent, usually glabrous. Leaves coriaceous, in verticils of 3 to 4, rarely opposite; the nerves more or less faint. Flowers rather small, in small axillary or terminal cymes. Calyx short, 4- to 5-partite, eglandular within. Corolla hypocrateriform; tube cylindric, slightly expanded opposite the stamens, throat naked;

lobes 5, slightly twisted, overlapping to the left. Stamens inserted above the middle of the tube; anthers lanceolate, their bases rounded. Disk none or obscurely annular. Ovary of 2 distinct carpels; style filiform; stigma oblong, urceolate or capitate, pointed or somewhat bifid; ovules 2 to 6 in two series in each carpel. Fruit of 1 or 2 drupes often pedicellate; drupes 1-seeded or with 2 to 4 one-seeded joints. Seeds ovoid or oblong, grooved or concave on the ventral surface at the attachment to the placenta; albumen horny, deeply ruminate, presenting horizontal parallel lamellæ; cotyledons thin, leafy, ovate or oblong, straight or curved; radicle long, thick.—Distrib. Tropical Asia, Australia, and Polynesia; about 30 to 35 species.

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Drupes .5 in. long or under:-
  Corolla pubescent without; leaves pubescent beneath
                                                           .. 1. A. pilosa.
  Corolla glabrous without; leaves usually glabrous beneath:-
    Leaves coriaceous :--
      Leaves mostly over 2 in. long:-
        Main nerves 16 to 20 pairs at an angle of 60° to 70°
                                                               2. A. lucida.
        Main nerves 25 to 40 pairs at an angle of 80° with
                                                               3. A. odorata.
      Leaves mostly under 2 in. long:--
        Main nerves 10 to 12 pairs at right angles to midrib . .
                                                               4. A. oleifolia.
        Main nerves 15 to 20 pairs at 75° to 80° with midrib...
                                                               5. A. pumila.
    Leaves chartaceous, 2.5 to 5 in. long, main nerves 27 to 30
                                                               6. A. Forbesii.
Drupes over .5 in. long:-
  Leaves thinly coriaceous, 4 to 6 in. long, main nerves ex-
  tremely numerous; drupes 1 in. long ...
                                                               7. A. Scortechinii.
  Leaves coriaceous, 3 to 4 in. long, main nerves 25 to 30 pairs;
  flower not known; drupe .75 in. long
                                                           .. 8. A. selangorica.
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1. ALYXIA PILOSA, Miq. Fl. Ind. Bat. II. 408 (1856). A slender climbing shrub; branches stout with pale bark; branchlets thinner than a goose-quill, angled, striate, dull brown, covered, especially the extremities, with dense minute grey tomentum. Leaves very coriaceous, opposite or more often in whorls of 3 to 4; lanceolate or elliptic-lanceolate, shortly acuminate at apex, cuneate or acuminately narrowed at base; upper surface shining olivaceous, lower pale yellowish-olivaceous densely short-pubescent; margins cartilaginous, recurved; 3 to 5 in. long, 1 to 1.5 in. broad; midrib very stout, very prominent on the under surface, impressed on the upper; main nerves 15 to 20 pairs, almost at right angles to the midrib, faintly depressed on the upper surface when dry, broad and pale on the lower; secondary nerves many, very indistinct, as are the reticulations; petiole 25 to 35 in. long, thick, bordered by the decurrent margins of the blade. Cymes axillary,

densely grey-pilose, reaching .75 to 1 in. in length; peduncles stout, ·25 in. long; flowers subumbellately crowded; bracts at the bases of the umbels lanceolate, 15 in. long; bracteoles smaller, three on each pedicel, which is scarcely 1 in. long; buds clavate, the tip ovate-acute; flowers yellowish-white (?). Calyx deeply cleft, 15 in. long; lobes ovate-lanceolate, densely pubescent. Corolla-tube cylindric, dilated near the top opposite the stamens, contracted at the mouth which bears inside an annular ring, 4 in. long, pubescent without and below the stamens within; lobes ovate-cordate, glabrous within, 15 in. long. Anthers elliptic lanceolate, apiculate, 06 in. long; filaments slender. Ovary (or the thin lobed disk surrounding and attached to it) densely villous: carpels 2; style slender, 25 in. long; stigma cylindric, with a bifid very short apiculus. Fruit of 1 or 2 pedicellate oblong-ellipsoid drupes. 5 in. long, 35 in. broad, tipped with the persistent base of the style; pericarp smooth, thin, wrinkled when dry. Seed 1, oblong, conform to the pericarp, furrowed on one side where it is attached to the placenta; testa membranous; albumen horny, deeply ruminate in closely packed horizontal lamellæ; cotyledons small, oblong; radicle long, cylindric. Hook. f. Fl. Br. Ind. III. 635.

PERAK: in dense jungle near the top of Gunong Malacca, at 3,500 to 4,000 feet, *King's Collector* 7170. MALACCA: on Mount Ophir, *Lobb.*—DISTRIB. Sumatra, Borneo (*Teysmann*, *Beccari* 1685, 2121).

Lobb's specimen has the leaves somewhat obovate, obtuse and almost emarginate at apex, but otherwise seems to be the same as the Peninsular and Sumatran specimens.

2. ALYXIA LUCIDA, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 540 (1824). A glabrous twining shrub; branches stout dark greyish-brown, sparsely lenticelled; branchlets quadrangular, grey to reddish-brown, shining. Leaves pergamaceous, opposite or in whorls of three, in young branches of four; elliptic or obovate, obtuse or bluntly acute at apex, cuneate at base; glabrous on both surfaces, the upper shining, olivegreen when dry, the lower dull and pale; margins cartilaginous, recurved; 1.75 to 3.5 in. long, 1 to 1.25 in. broad; midrib slender, impressed above, raised beneath; main nerves 16 to 20 pairs, slender, at 60° to 70° with the midrib, straight to join an intramarginal nerve at 05 in. from the edge or nearer, indistinct on both surfaces, less so on the lower; secondary nerves many, between and similar to the main nerves, often branched; reticulations obscure; petiole ·1 to ·3 in. long, stout, bordered by the decurrent margins of the blade. Cymes axillary, trichotomous, corymbosely subumbellate, puberulous, reaching '75 in. long; peduncles angular, about ·2 in. long; pedicels slender, ·1 in. long; bracts linear-subulate, acute; bracteole on the pedicel, rounded; buds

clavate 3 in. long, the tip ovate; flowers yellowish-white, fragrant. Calyx deeply 5-cleft; lobes linear, acute, 06 in. long, pubescent, ciliate on the margins. Corolla-tube narrowly cylindric, slightly dilated near the top opposite the stamens, contracted at the throat which is naked but furnished with an annular fold within, glabrous without, puberulous below the stamens within; lobes oblong, broad, 125 in. long, recurved. Stamens inserted below the throat of the tube; anthers lanceolate, ·05 in. long; filaments as long, slender. Disk of 5 minute very villous scales, surrounding the ovary and almost adherent. Ovary of 2 distinct carpels, ovoid, glabrous; style 15 to 2 in. long, very slender; stigma oblong, apiculus bifid. Fruit of 1 or 2 pedicellate drupes; the pedicels ·3 to ·5 in. long; drupes ·5 in. long, ·3 in. broad, ellipsoid, shortly apiculate; pericarp thin, striate. Seed solitary, 3 to 5 in. long, 2 to ·3 in. broad, ellipsoid, deeply cleft on one side where it is attached to the placenta; testa membranous; albumen horny, deeply ruminate, and presenting closely packed horizontal lamellæ; cotyledons flat, oblong, 075 to 1 in. long; radicle cylindric, stout, 15 in. long. Hook. f. Fl. Br. Ind. III. 635. A. Gynopogon, Syst. Veg. IV. 440; Wall. Cat. 1605. A. quinata, Miq. Fl. Ind. Bat. II. 407, fide Stapf in Trans. Linn. Soc. Ser. 2, IV. 207.

KEDAH: at Gunong Raya, Curtis 2547. Penang: Curtis 2881, 3088. Perak: Ridley 7177; Cantley. Dindings: Pangkor, at Rajah Itam, Curtis 1622. Malacca: cultivated, Maingay (K.D.) 1054. Singapore: Wallich 1605; Murton 12; Ridley 1801, 4427, 8905.—Distrib. Sumatra, Borneo (Haviland 2176, flowers rather longer than type).

3. ALYXIA ODORATA, Wall. Cat. 1606 (1829). A climbing shrub, with smooth very dark brown bark; young branches thinner than a goose-quill, 4-angled, shining, dark red-brown when dry. Leaves coriaceous, opposite or in whorls of 3 to 4; oblanceolate or oblongoblanceolate, obtuse or subacute at apex, narrowed at the base; both surfaces glabrous, pale brown when dry, the upper shining, the lower rather dull; margins recurved; 2 to 5 in. long, 1 to 1.5 in. broad; midrib stout, impressed above, raised and sharp beneath; main nerves extremely numerous, perhaps 25 to 40 in number, but difficult to distinguish from the equally numerous secondary nerves, which are branched and often recurrent, usually at an angle of 80° with the midrib and straight to join an intramarginal nerve close to the edge, raised but faint on the upper surface, almost invisible on the lower; petiole ·2 to ·3 in. long, bordered by the decurrent margin of the blade. Cymes axillary, about 5 in. long, including the short angled peduncle, fewflowered; pedicels 06 in. long, angular, pubescent; bracts lanceolate;

buds clavate, '3 to '4 in. long, tip ovate. Calyx campanulate, '1 in. long; lobes 5, linear-lanceolate, pubescent. Corolla-tube cylindric, dilated near the top opposite the stamens, contracted at the throat which is annulate within, glabrous outside, pubescent within, '4 in. long; lobes ovate, broadly obtuse, recurved, '125 in. long. Anthers narrowly ovate; filaments short, slender. Disk none or so appressed to the ovary as to be indistinguishable, white-villous. Ovary of 2 rounded carpels; style very slender, '3 in. long; stigma capitate. Fruit of 2 or 1 ellipsoid, long- (up to '4 in.) pedicelled drupes, often 2-seeded by superposition; each drupe '4 to '5 in. long, '3 in. broad; pericarp ribbed, furrowed on one side opposite the placenta. Seed conform to the drupe; testa membranous, separated; albumen deeply ruminate in horizontal lamellæ.

MALACCA: Griffith. SINGAPORE: at Sungei Morai, Ridley 4427, 5659.—DISTRIB. Burma (Tenasserim, Wallich 1606).

Ridley's specimens show smaller leaves than those of the type, of which there is only one specimen, viz. in the Wallichian Herbarium at the Linnean Society, but the shape and nervation agree, as does the bark of the twigs. The Wallichian specimen and Griffith's being in fruit only, the description of the flowers is taken from Ridley's.

4. ALYXIA OLEIFOLIA, King & Gamble, n. sp. A small climbing or epiphytic shrub; branchlets rather thick, boldly angled, with smooth pale brown bark, minutely rugose and puberulous; nodes swollen and ridged. Leaves thickly coriaceous, opposite or in whorls of three; elliptic or elliptic-lanceolate sometimes almost rhomboid, acute at apex or slightly blunt-acuminate, narrowed at base; upper surface shining, dark olivaceous, lower surface dull vellowish-olivaceous, both surfaces glabrous, lower sometimes puncticulate; margins much recurved when dry; 1.5 to 2.5 in. long, .75 to 1.25 in. broad; midrib very stout and broad, much impressed above and raised beneath; main nerves 10 to 12 pairs, at right angles to the midrib, often forked, depressed above, invisible beneath; secondary nerves many, very obscure; reticulations invisible; petiole stout, 15 to 25 in. long, wrinkled, bordered by the decurrent margins of the blade. Cymes subterminal and axillary, reaching about 1 in. in length, glabrous, few-flowered; peduncles 3 to ·5 in. long, angular, as are the branches; pedicels short; bracteoles linear-subulate, similar to the calvx-lobes; buds clavate, 4 to 5 in. long, tip ovate. Calyx campanulate, deeply 5-lobed; lobes linearsubulate, 1 in. long, ciliate. Corolla-tube cylindric, slightly dilated opposite the stamens, contracted at the mouth which is annulate within, glabrous except slight pubescence below the stamens within; lobes ovate, obtuse, erect or slightly recurved, 15 in. long. Anthers

ovate-lanceolate, '05 in. long; filaments slender. Disk of 5 densely villous scales surrounding the ovary. Ovary of 2 rounded carpels, puberulous; style slender; stigma globose with a bifid apiculus; ovules 1 in each cell. Fruit of 1 or 2 very shortly pedicellate ellipsoid drupes, each drupe about '5 in. long and '35 in. broad; pericarp crustaceous, striate, slightly furrowed on one side opposite the placenta, transversely ridged within. Seed 1, grooved on one side where it is attached to the placenta, '4 in. long, '25 in. broad; testa membranous; albumen horny, deeply ruminate in horizontal lamellæ; cotyledons ovate, '1 in. long; radicle cylindric, thick, '15 in. long.

PERAK: in the mountains, at 4,500 to 5,500 feet, Wray 230, 3846, 4116; Scortechini; King's Collector 7405; Cantley, at Gunong Bubu, 5,040 feet.

5. ALYXIA PUMILA, Hook. f. Fl. Br. Ind. III. 635 (1882). A small climbing shrub; branchlets as thick as a crow-quill, angled, reddishbrown, minutely rugose, innovations with deciduous pubescence. Leaves coriaceous, opposite or in whorls of 3; narrowly elliptic or ovate- or lanceolate-elliptic, acute or shortly subacuminate at apex, cuneate at base or slightly rounded; both surfaces glabrous except when very young, upper shining dark olivaceous, lower dull and pale almost yellowish; margins recurved; .75 to 2 in. long, .35 to .75 in. broad; midrib rather slender, impressed above, raised beneath; main nerves 15 to 20 pairs. at from 75° to 80° with the midrib, very faint on the upper surface, invisible on the lower; secondary nerves few, faint, reticulations invisible; petiole 1 to 15 in. long, stout, bordered by the decurrent margins of the blade. Cymes short, axillary, 5- or 6-flowered, on 25 in. long peduncles. Calyx deeply 5-lobed; lobes linear, ciliate, .05 in. long. Corolla-tube cylindric below, dilated near the top opposite the stamens. then constricted above, 2 in. long, glabrous without, pubescent within below the stamens; lobes ovate, 05 in. long, glabrous, spreading; throat not annulate. Anthers lanceolate, acute, rounded at base, 04 in. long. Disk 5-lobed, white-villous. Ovary 2-carpelled; style slender; stigma oblong. Fruit of 2, usually 1, short-pedicelled ellipsoid drupes, each about 4 in. long, 3 in. broad; pericarp crustaceous, shining, grooved on one side. Seed conform to the drupe, grooved on one side at the attachment to the placenta; testa thin, separated; albumen horny, ruminated in flat lamellæ.

Kedah: at Gunong Jerai, Ridley 5504. Perak: top of Batu Kusan, Scortechini 1621. Malacca: Maingay (K.D.) 1053; on Mount Ophir, Ridley 10094; Lobb.

6. ALYXIA FORBESII, King & Gamble, n. sp. A climbing shrub; branchlets as thick as a crow-quill, 3-angled, pale brown, shining,

glabrous; the nodes slightly swollen, ridged. Leaves chartaceous. opposite or in whorls of 3 to 4; lanceolate, oblong-lanceolate or ellipticlanceolate, obtusely rather long-acuminate at apex, cuneate at base: both surfaces glabrous, green when dry, the lower slightly paler and dull; margins very slightly recurved, thinly cartilaginous; 2.5 to 5 in. long. 75 to 1.5 in. broad; midrib slender but prominent, impressed above, raised beneath; main nerves very numerous, 27 to 30 pairs, at an angle of about 80° with the midrib, slender, straight to join a slender intramarginal nerve less than 05 in. from the edge, difficult to distinguish from the very numerous, often branching, secondary nerves; reticulations irregular, all nerves rather faint on the upper, very obscure on the lower surface; petiole 05 to 1 in. long, bordered by the decurrent, usually connivent margins of the blade. Cymes axillary, slender, lax, glabrous, 3- to 5-flowered, reaching in all about 1 in. in length; peduncles 25 in. long; pedicels very slender, 1 to 15 in.; bracts 0 or linear, leafy, caducous; buds clavate, 5 in. long, tip ovate; Calyx shortly campanulate, deeply 5-lobed; lobes flowers white. ovate-acute, spreading, 1 in. long. Corolla-tube cylindric, 4 to 6 in. long, slightly dilated near the top opposite the stamens, contracted at the throat, which is annulate within, glabrous except the upper part within; lobes ovate-cordate, 15 to 2 in. long, recurved. Anthers lanceolate, rounded at base; filaments short, slender. Disk undulately 5-lobed, white-villous, enclosing the ovary. Ovary of 2 rounded glabrous carpels; style very slender; stigma globose, with a bifid apiculus. Fruit of 1 or 2 ellipsoid drupes on very short pedicels, each drupe 4 to 5 in. long and 3 in. broad, grooved on one side opposite the placenta; pericarp thin, almost membranous. Seed 1, conform to the drupe; testa membranous; albumen horny, deeply ruminate; cotyledons oblong, 15 in. long; radicle stout, 1 in. long, the base oblique. A. stellata, Wall. Cat. 1604; Hook. f. Fl. Br. Ind. III. 636 (not of Roem. and Sch.). Gynopogon stellatum, Kurz in Journ. As. Soc. Beng. XLVI. ii. 251, and For. Fl. II. 176 (not of Labill.).

Penang: Wallich 1604. Perak: at Gunong Iras, 4,000 feet, Wray 4165; on Larut Peak, 3,000 to 4,000 feet, King's Collector 2124; Scortechini. Pahang: at Kluang Terbang, W. D. Barnes 10898.—DISTRIB. Sumatra (Forbes 2268; on Mount Dempo, at 4,000 to 5,000 feet, 2256); Java (Forbes 1043).

On following up the suggestion made in the Fl. Br. Ind. that this plant is not identical with the Polynesian A. stellata, we feel bound to agree, and consider it best to give it a new name.

7. ALYXIA SCORTECHINII, King & Gamble, n. sp. A climbing shrub; young branches thinner than a goose-quill, pale brown, shining, angled,

minutely rusty-puberulous, nodes swollen. Leaves thinly coriaceous, in whorls of 3 or opposite; oblong-oblanceolate, shortly cuspidateacuminate at apex, narrowed at the base from above the middle; upper surface dark-olivaceous, glabrous, shining when dry, lower surface almost dull, paler and in young leaves minutely puberulous especially along the midrib; margins thin, slightly recurved; 4 to 6 in. long, 1.5 to 2 in. broad; midrib stout, impressed above, raised beneath; main nerves extremely numerous, probably more than 50, but difficult to distinguish from similar secondary nerves, usually at an angle of 80° with the midrib, straight to join an intramarginal nerve at a little less than 05 in. from the edge, much branched recurrently, raised on the upper surface; reticulations in a minute network; petiole 3 to 5 in. long, transversely corrugated when dry and bordered by the decurrent edges of the blade. Cymes sessile, axillary, densely crowded, about twice as long as the petioles; bracts numerous, linear-lanceolate, pubescent; pedicels very short, bracteolate below the calyx; buds clavate, 5 in. long, tip oblong obtuse. Calyx 15 in. long, campanulate, deeply cleft in 4 to 5 linear lobes, 1 in. long, pubescent outside, glabrous within. Corolla-tube cylindric, dilated near the top opposite the stamens, contracted at the mouth, which is annulately folded within, pubescent within and on the upper half without, 4 in. long; lobes 4 to 5, ovate, erect or recurved, pubescent, margins incurved, ·15 in. long. Anthers ovate-lanceolate, apiculate, ·05 in. long; filaments slender. Disk villous, appressed to the ovary. Ovary of 2 conical carpels; style very slender, 3 in. long; stigma minute, capitate. Fruit of 2, more usually 1, ellipsoid, long-pedicelled drupes, about 1 in. long and 5 in. broad; pericarp ribbed when dry, especially opposite the placenta. Seed conform to the drupe; albumen ruminate; cotyledons oblong; radicle cylindric, rather long.

PERAK: Scortechini; at lower camp, Gunong Batu Poteh, Wray 1091; at Kwala Kangsa, Ridley 2895.

Ridley's specimen is the only one with fruit and its leaves are rather thinner than those of the other specimens, but otherwise it corresponds well enough. To this species probably also belong Burbidge's specimens in leaf only from Borneo, and Beccari's No. 333 from Sumatra, all in the Kew Herbarium.

SPECIES IMPERFECTLY KNOWN.

8. ALYXIA SELANGORICA, King & Gamble, n. sp. A slender climbing shrub; branchlets the size of a crow-quill, pale brown, shining, angled. Leaves coriaceous, opposite or in whorls of 3 to 4; obovate or oblanceolate, shortly and abruptly acuminate at apex, long cuneate at base;

olivaceous and shining on the upper surface, dull and rather paler and minutely rusty-puberulous on the lower; margins recurved; 3 to 4 in. long, 1 to 1.25 in. broad; midrib stout, impressed above, raised beneath; main nerves very many, 25 to 30 or more, difficult to distinguish from the similar but rather fainter secondary nerves, these latter recurrentbranched, all meeting an obscure intramarginal nerve, nearly at right angles to the midrib, obscure on both surfaces but slightly raised on the upper; petiole 25 in. long, rusty-pubescent, bordered by the decurrent margins of the blade. Flowers not known, but fruiting cymes axillary, scarcely longer than the petiole, few-flowered. Fruit of 1 or 2 long-pedicelled drupes; pedicels 3 to 4 in. long; drupes oblong ellipsoid, acute at both ends, .75 in. long, .35 to .45 in. broad: pericarp black and wrinkled when dry. Seed conform to the drupe but rounded at the ends, grooved on one side where it is attached to the placenta; testa thin, separated; albumen horny, much ruminate in horizontal lamellæ; cotyledons oblong, 2 in. long, 075 in. broad; radicle stout, eylindric, 225 in. long.

Selangor: at Gua Batu, *Ridley* 8558.—Distrib. Sumatra (*Forbes* 3212).

6. RAUWOLFIA, Linn.

Trees or shrubs, glabrous or rarely pubescent. Leaves 3- to 4-nately whorled or opposite (rarely); nerves slender. Flowers in corymbose or umbellate cymes, usually compound, alternate with the terminal leaves or axillary to the upper leaves. Calyx short, 5-lobed, eglandular. Corolla-tube cylindric, sometimes dilated opposite the stamens, constricted at the mouth, the throat usually hairy within; lobes 5, broad, overlapping to the left. Stamens included in the corolla-tube above the middle; filaments short; anthers small, acute, rounded at base. Disk cup-shaped or annular. Carpels 2, distinct or connate; style filiform; stigma broad, calyptriform or peltate; ovules 2, collaterally placed, in each carpel. Fruit of 2 connate or distinct drupes, each with a crustaceous 1-seeded pyrene. Seeds ovate; testa thin; albumen thin, fleshy; cotyledons flat; radicle large, superior.—Distrib. About 50 species, chiefly tropical American; about 10 from India and the Malay Peninsula and islands.

1. RAUWOLFIA PERAKENSIS, King & Gamble, n. sp. A small shrub; branchlets somewhat fleshy, pale brown, as thick as a goose-quill, sparsely lenticellate. Leaves fleshy in texture when green, membranous when dry; opposite or whorled, variable in size, glabrous; lanceolate or spathulate, rather long acuminate at apex, narrowly attenuate at base: bright green above turning dark brown when dry, greyish-green beneath turning buff; 4 to 8 in. long, 1 to 3 in. broad; midrib broad, often sinuous when dry; main nerves 12 to 15 pairs, pale, starting from the midrib nearly at right angles and curved upwards to and along the margin; secondary nerves and reticulations obscure; petiole slender, ·5 to ·75 in, long. Cymes corymbose, long-peduncled, 1 to 4 together from the axils of upper leaves; peduncle 1.5 to 3.5 long; branches dichotomous, ultimate ones subumbellate; pedicels slender, 1 in. long, ·25 in. fruit: bracts minute, triangular, caducous. Calyx-lobes ovateacuminate, 06 in. long, glabrous. Corolla-tube slender, 3 to 5 in. long, tubular, inflated towards the top, glabrous on both sides; lobes ovate, blunt, about 1 in. long. Disk annular, 04 in. long. Stamens short, blunt; anthers as long as the filaments. Ovary rounded; style filiform 15 to 2 in. long; stigma cylindric-calyptriform. crimson, connate only at the base, obliquely ovate, 5 in. long, 25 in. broad, flattened; exocarp fleshy. Pyrenes crustaceous, prominently rugose; albumen thin; cotyledons ovate; radicle as long as cotyledons, together 25 to 3 in. long.

Perak: Scortechini 920, 1161, 8410; Wray 3692; Ridley 2898, 5523. Pahang: Ridley 1166.

This species is very near R. densiflora, Benth., of Ceylon, S. India, and the Khasia Hills, but differs in the much shorter calyx-lobes, the narrower corolla-tube, and the flattened drupes. From R. serpentina, Benth., it differs in the veins of the leaves starting nearly at right angles instead of obliquely, and in the larger, usually more separated and flatter drupes and more pitted pyrenes

2. Rauwolfia sumatrana Jack Mal. Misc. 22 (1820). A small tree reaching 40 to 50 feet in height, and 6 to 10 in. in diameter, with erect stout branches and milky juice; branchlets more or less quadrangular, lenticellate. Leaves pergamaceous, opposite or verticillate, generally in threes, sometimes in fours, elliptic-oblong to obovate-spathulate, shortly acute or acuminate at apex, long-attenuate at base; margins entire, slightly reflexed; both surfaces glabrous, the lower pale; 6 to 8 in. long, 2 to 3 in. broad; midrib slender, very prominent, impressed above, much raised beneath; main nerves parallel, 32 to 35 pairs, nearly at right angles (80°) to the midrib, then straight, joining in a looped intramarginal nerve near the edge; secondary nerves similar but fainter, usually one only between each pair of main nerves; reticulations very

few; petiole '75 to 1 in. long, slightly winged by the decurrent margins of the blade. Flowers in terminal compound umbels; primary peduncles 3 to 5, stout, 3 to 4 in. long; secondary peduncles 6 to 8, 1 to 1.5 in. long; tertiary peduncles 3 to 5, about 5 in. long; quaternary peduncles and pedicels slender, 1 to 25 in. long, umbellules of about 4 to 6 flowers; bracts subulate, recurved; bracteoles very minute; buds subglobose, flowers white. Calyx-lobes imbricate, nearly orbicular, 05 in. long on a tube of same length. Corolla-tube campanulate, 2 in. long; lobes rounded, recurved, 05 to 1 in. long; tube tufted-pubescent within at the mouth and a little below it; lobes short, rounded. ·075 in. long. Anthers sagittate mucronate, ·04 in. long; filaments very short. Disk thick, short, barely 025 in. long, obscurely 5-lobed. Ovary 2-celled, furrowed; style slender, 1 in. long; stigma peltate; cells 2-ovuled. Drupe oblong-globose, smooth, 6 to 7 in. long, 5 to 6 in. broad; pyrenes two, compressed at top, enlarged below, beaked, longitudinally furrowed and rugose, woody. Seed flattened; testa membranous; albumen thin; embryo flattened; cotyledons ovate, 1 in. long; radicle thick, as long as cotyledons. Hook. Bot. Misc. II. 73: Blume Bijdr. 1034; A. DC. Prodr. VIII. 337; Hassk. Fl. Bot. Zeit. (1845) 263; Spanoghe in Linnæå, XV. 325; Koord. & Val. Bijdr. I. 93. Cyrtosiphonia sumatrana, Mig. Fl. Ind. Bat. II. 401.

PERAK: Scortechini 132, 1737; King's Collector 4755, 5700.— DISTRIB. Sumatra (Teysmann 993, 995; Forbes 2851, 2860), Java (Forbes 1051).

Jack says that the wood is very light, and is used by the Sumatrans for the scabbards of swords and krises.

7. Hunteria, Roxb.

Glabrous trees. Leaves opposite, coriaceous, shining, with many slender nerves. Flowers in short close axillary or subterminal cymes. Calyx small, 5-lobed, eglandular. Corolla salver-shaped; the tube cylindric, somewhat dilated near the mouth, throat annulate; lobes much overlapping to the left. Stamens inserted in the dilated portion of the tube; anthers oblong-lanceolate, cells rounded at the base; filaments short. Disk none. Carpels 2, distinct; style filiform, thickened at top; stigma bifid; ovules 2 to 4 in each carpel. Fruit of two stalked berries, distinct or connate at base, ovoid or subfusiform, oblique or recurved, 1-seeded or 2-celled by the intruded placenta, not pulpy. Seeds ovoid or oblong; testa membranous; albumen smooth, fleshy; cotyledons ovate, leafy; radicle straight. — Distrib. Three species—one of India, Ceylon, and Malay Peninsula, another of Java, and a third of tropical Africa.

HUNTERIA CORYMBOSA, Roxb. Fl. Ind. I. 695, and ed. Carey and Wall. II. 531 (1824). A tree, reaching 30 to 40 feet in height and 15 to 20 in. in diameter; branchlets slender, slightly angled and striate, and dull brown when dry. Leaves oblong or oblong-lanceolate, obtusely abruptly caudate-acuminate at apex, acute at base; glabrous on both surfaces; 3 to 7 in. long, 1 to 2 in. broad; midrib slender, impressed above, prominent beneath; main nerves numerous, about 22 to 26 pairs, slender, slightly curved upwards to meet in an intramarginal nerve close to the edge; secondary nerves similar to main-nerves, recurrentbranched; reticulations prominent, all more or less raised on both surfaces when dry; petiole 25 to 5 in long, slender. Cymes on short peduncles about 5 to 75 in. long; branches corymbose, short; pedicels slender, angled, 1 to 2 in. long; bracts minute; flower-buds slender, ·5 to ·6 in. long; flowers waxy-white. Calyx-lobes ovate-acute, ·05 to ·1 in. long, glabrous. Corolla-tube cylindrical, ·3 to ·35 in. long, slightly dilated above and annulate at the throat, minutely pubescent within; lobes ovate-oblong, 2 to 25 in. long. Stamens with short filaments; anthers 05 in. long. Carpels conical, glabrous. Berries globose, obtusely beaked, smooth, yellow, 2-seeded, 75 in. in diameter, on a ·25 in. long flattened stalk. Seeds ovoid, flattened on one side, convex on the other, 5 in. long, 4 in. broad; testa very thin; albumen thick, fleshy; cotyledons ovate, 125 in. long, 3-nerved; radicle stout, cylindric, as long as the cotyledons. Wall. Cat. 1608; Wight Ic. t. 428; A. DC. Prodr. VIII. 350; Mig. Fl. Ind. Bat. II. 409; Hook, f. Fl. Br. Ind. III. 637; Trimen Fl. Ceyl. III. 128. H. zeylanica, Gardn.; Thw. Enum. 191; Bedd. Fl. Sylv. t. 265. H.? lanceolata, Wall. Cat. 161; A. DC. l.c. H. Roxburghiana, Wight Ic. t. 1294; Thw. Enum. 192; Bedd. l. c. CLVIII. Cameraria zeylanica, Retz. Obs. IV. 24; A. DC. l. c. 389. Gynopogon lanceolatum, Kurz For. Fl. II. 177. Tabernæmontana salicifolia, Wall. Cat. 1580. T. parviflora, Herb. Heyne.

Kedah; on Lankawi Island, Curtis 237. Penang: Wallich 1608; King's Collector 1460, 1468; Phillips. Perak: Wray 3378; King's Collector 7465. Selangor: Ridley 8556.—Distrib. India, Ceylon, Burma, Sumatra (Forbes 2716, 2722, 2737).

Subtribe 2.—Cerberinæ.

8. Cerbera, Linn.

Small glabrous trees or large shrubs. Leaves alternate or scattered, long, with slender parallel nerves. Flowers large, white or red, in pseudo-terminal cymes. Calyx 5-lobed, eglandular, the segments long; tube almost none. Corolla large; tube funnel-shaped above,

cylindric below; lobes 5, spreading, overlapping to the left. Stamens included, small; anthers lanceolate, apiculate, rounded at base. Disk none. Carpels 2, distinct; style filiform; stigma large, disciform, with a bilobed apiculus; ovules 4 in each carpel, on both sides of a thick placenta. Fruit of 1, rarely 2, globose or ellipsoid drupes; pericarp very thick, fibrous and woody. Seeds broad, compressed, peltately attached to the enlarged placenta; albumen none; cotyledons thin; radicle very short.—Distrib. Species 4, found in Madagascar, tropical Asia and the Pacific Islands.

CERBERA ODOLLAM, Gaertn. Fruct. II. 193, t. 124 (1791). A small tree or large shrub, with very thick branches and stout branchlets prominently marked by the scars of fallen leaves. Leaves leathery; variable in shape and somewhat in venation; oblanceolate or oblong-obovate, acute or abruptly short acuminate at apex, attenuate at base; black when dry, glabrous on both surfaces, shining above; 3 to 8 in. long, 1 to 2 in. broad; midrib slender; main nerves numerous but variable in number (15 to 25), starting nearly at right angles to the midrib, straight and meeting in an intramarginal looped nerve; secondary nerves many, between the main nerves, reticulations indistinct; petiole ·75 to 1.5 in. long, stout. Cymes large; main peduncles stout, 3 to 5 in. long; branches corymbosely paniculate; bracts oyate, deciduous, leafy, 5 to 1 in. long; pedicels 75 to 1 in.long, stout; flowers white with a red or yellow throat. Calyx glabrous, lobes linear-oblong, acuminate, 5 to 1 in. long. Corolla-tube 5 to 75 in. long, cylindric below, funnel-shaped above, pubescent and ribbed within and furnished with 5 projecting ribs at the mouth; lobes broadly elliptic, oblique, acute, about as long as the tube. Drupe ovoid, 2 to 4 in. long, smooth, green; 2 to 4 in. in diameter; pericarp very thick, fleshy without, fibrous within. Seeds broad, compressed; cotyledons fleshy, ovoid, flattened. A. DC. Prodr. VIII. 353; Wight Ic. t. 441; Roxb. Fl. Ind. I. 692, and ed. Carey & Wall. II. 527; Miq. Fl. Ind. Bat. II. 413; Brandis For. Fl. 322; Kurz For. Fl. II. 171; Bedd. Fl. Sylv. CLVII.; Hook. f. Fl. Br. Ind. III. 628; Trimen Fl. Ceyl. III. 128; Cooke Fl. Bomb. II. 128; Prain Beng. Plants 670; Koord. & Val. Bijdr. I. 84. C. Manghas, Linn. Sp. Pl. 208, partly; Wall. Cat. 1582 and Roxb. Fl. Ind. ed. Carey & Wall. II. 529; Hook. Bot. Mag. t. 1845; K. Schum. in Engl. & Prantl Nat. Pflanzenfam. IV. 2, 159, fig. 57, P to S. C. lactaria, Ham.; A. DC. l. c.; Miq. l. c. 414. C. laurifolia, Lodd. Bot. Cab. t. 989. Tanghinia Odollam, lactaria, and laurifolia, G. Don Gen. Syst. IV. 98. "Odollam," Rheede Hort. Mal. I. t. 39.

Penang: Wallich 1582; Curtis 1651, 1713. Perak: Scortechini 964; Wray 2508; Ridley 7178; King's Collector 1131. Malacca: Griffith; Hervey. Singapore: Ridley 8083; Hullett 807, 871.—

DISTRIB. India, Ceylon, Burma, Malay Archipelago, China, Australia, Pacific Islands.

A plant of sea-coasts and tidal creeks. Hullett says the Malay name is "Betakbetak," and that the milky juice is poisonous. Linnæus's name, C. Manghas, ought to take precedence of Gaertner's, but it was applied to two species, the former of which belonged to a different genus, so we follow the Fl. Br. Ind. and other authorities in retaining Gaertner's name.

9. Ochrosia, Juss.

Trees. Leaves whorled, rarely opposite or scattered; nerves very numerous, parallel, spreading. Cymes pedunculate at the ends of the branches, alternate with the uppermost leaves, finally lateral. Calyx 5-lobed, eglandular. Corolla salver-shaped; tube cylindric, not or very slightly dilated opposite the stamens, throat naked; lobes 5, twisted, overlapping to the right. Stamens included in the tube of the corolla, at or above the middle; anthers lanceolate, rounded at the base. Disk very small, annulate, or none. Carpels 2, distinct or connate at the base; style filiform; stigma oblong, 2-fid; ovules in each carpel 2 to 6, biseriate, on either side of a prominent placenta. Fruit of 2 spreading drupes, sometimes connate at the base; epicarp thinly fleshy; endocarp thick, hard, often dorsally compressed and more or less grooved ventrally. Seeds solitary or 2 separated by the placenta, flattened; testa membranous; albumen absent or fleshy; cotyledons large, flat, foliaceous; radicle short, superior.—DISTRIB. About 12 species, found from the Mascarene Islands eastwards through the Malay Archipelago to Australia and the Pacific.

Ochrosia Borbonica, Gmel. Syst. Veg. I. 439 (1796). A small evergeen glabrous tree, reaching 20 feet in height; branches very stout, fleshy; branchlets fleshy, glaucous green, marked with the prominent scars of fallen leaves. Leaves fleshy when green, membranous when dry, in whorls of 3 to 4 or irregularly placed; obovate, obtuse and very briefly apiculate at apex, cuneately narrowed at base; upper surface shining, lower pale; 4 to 10 in. long, 2 to 5 in. broad; midrib stout. raised on both sides; main nerves many, 20 to 26 pairs, slender, parallel, leaving the midrib at an angle of about 80° and slightly curving to meet in an intramarginal nerve close to the edge; secondary nerves 1 to 2 between each pair of main nerves branching and joining the irregular reticulations; petiole 5 to 1.5 in. long, thick. Cymes in short, thick, corymbose branches; primary peduncles stout, 1 to 4 in. long; secondary peduncles about 1 in. long; branches and pedicels short, thick; lower bracts somewhat leafy, upper deciduous; bracteoles 2, triangular, on the pedicels below the calyx; flowers white; buds elongate. Calyx-lobes

coriaceous, ovate; tube about equal to lobes, Corolla-tube cylindric, about ·15 in. long, glabrous within; lobes spreading, oblong, as long as tube or rather longer. Drupes 2 to 2·5 in. long, 1·75 in. broad, slightly recurved, yellow, obliquely ovoid. Seeds large, flat. A. DC. Prodr. VIII. 356; Wall. Cat. 1584; Bedd. Fl. Sylv. CLVIII.; Hook. f. Fl. Br. Ind. III. 638; Trimen Fl. Ceyl. III. 129, t. 60. O. salubris, Blume Mus. Bot. I. 158; Kurz For. Fl. II. 172. Cerbera salutaris, Lour. Fl. Cochinch. I. 163; Blume Bijdr. 1033. C. parviflora Wall. Cat. 1584. C. oppositifolia Lam. Enc. I. 62; A. DC. l.c. 354. C. platysperma, Gaertn. Fruct. II. 193. Lactaria salubris, Rumph. Herb. Amb. II. 255, t. 84; Miq. Fl. Ind. Bat. II. 415. Calpicarpum Lamarckii, G. Don Gen. Syst. IV. 100.

SINGAPORE: Wallich 1584.—DISTRIB. Andaman Islands, Ceylon, Mascarene Islands, Malay Archipelago.

A plant of the tidal creeks, "more decidedly maritime than Cerbera Odollam" (Trimen). The milky juice is thick and viscid. The leaves as shown in Trimen's plate are not at all characteristic.

10. Kopsia, Blume.

Glabrous trees or shrubs. Leaves opposite, membranous or subcoriaceous, penniveined. Flowers white or pink, in short terminal cymes; the rachis often bearing imbricated bracts. Calyx small, 5-partite, eglandular within. Corolla salver-shaped; tube very slender, only slightly dilated opposite the stamens, without scales at the mouth, pilose within; lobes twisted, overlapping to the right. Stamens near the top of the tube; anthers acute, cells rounded at the base. Disk of 2 glands alternating with the carpels. Carpels 2, distinct; style filiform; stigma thickened, with a short apiculus; ovules 2 in each carpel, 1 on either side of a thick placenta. Fruit of 2 obovoid or obliquely quadrate drupes or capsules, furrowed on the anterior face; pericarp subcoriaceous, 1-seeded, or 2-celled by the intruded placenta and two-seeded. Seeds oblong; testa membranous; albumen none; cotyledons usually thick.—Distrib. About 12 species of the Malay Peninsula and Archipelago.

Tube of corolla dilated at the top :-

Branches of the inflorescence with rather distant bracts:-

Leaves usually more than 5 in. long and 2 in. broad:—

Cymes much-branched, many-flowered; lobes of corolla

broad 1. K. fruticosa var. albiftora.

Cymes little-branched, few-flowered; lobes of corolla

narrow 2. K. pauciflora.

Leaves usually under 5 in. long and 2 in. broad:—

Carpels glabrous; corolla-tube under 1 in. long; calyxlobes acuminate 3. K. Scortechinii. Carpels hairy; corolla-tube over 1 in. long; calyx-lobes ... 4. K. Griffithii. Branches of the inflorescence covered with many closely imbricating bracts: bracts very small; cyme-branches very short; corolla-tube under ·4 in. long 5. K. larutensis. Tube of corolla dilated in the middle; branches of the inflorescence with imbricating bracts :-Cymes under 5 in. long; leaves lanceolate, under 45 in. .. 6. K. Ridleyana. Cymes 1 to 3 in. long; leaves elliptic-oblong or oblong-.. 7. K. macrophylla. obovate, 5 to 9 in. long ..

1. Kopsia fruticosa. A. DC. Prodr. VIII. 352 (1844). A large evergreen shrub; branchlets smooth, pale brown. Leaves thinly coriaceous, opposite; elliptic, elliptic-oblong; or elliptic-lanceolate. obtusely caudate-acuminate at apex, acuminately attenuate at base; glabrous on both surfaces, shining above, pale beneath; 4 to 9 in. long, 1.5 to 3.5 in. broad; midrib thick; main nerves prominent beneath, 10 to 14 pairs, more or less parallel, gradually curving upwards to meet in a faintly looped intramarginal nerve close to the edge; secondary nerves short; reticulation distinct; petiole short, 25 in. long, ending in a gland at the apex. Cymes short, in a dense many-bracted subtrichotomous corymb at the ends of pseudo-terminal peduncles; peduncle short, stout; secondary peduncles also short, as are the tertiary and the pedicels; all minutely fulvous-pubescent, as are the bracts; bracts many, ovate, acute or obtuse, 1 to 15 in. long, pubescent, ciliate on the edges, leaving when they fall prominent scars; bracteoles similar, 2 on each pedicel under the calvx. Calvx-tube short; lobes 5, minutely pubescent, ovate-oblong, obtuse or emarginate and with a gland at the apex, ciliate on the margins, 15 to 2 in. long. Corolla-tube slender, slightly dilated at the summit opposite the stamens, 1.5 in. long; mouth red, minutely pubescent; lobes elliptic obovate, obtuse, half as long as the tube or slightly more, pink. Anthers oblong-lanceolate, acute. Disk-glands beaked. Carpels 2, oblong, obtuse; style slender; stigma calvptriform, 2-lobed at top. Fruit of 2 (more usually 1) urn-shaped flattened capsules, more or less triangular in shape, 1 to 1.25 in. long, villous, veined, opening by a slit on the ventral margin. Seeds oblong-lanceolate, 8 in. long, 25 in. broad, 3-ribbed; testa membranous; albumen none; cotyledons oblonglanceolate, 75 in. long, 25 in. broad, fleshy; radicle very small. Bot. Mag. 4220; Hook. f. Fl. Br. Ind. III. 639; Prain Beng. Plants, 671. Calpicarpum Roxburghii, G. Don Gen. Syst. IV. 100; Wight Ic. t. 431; Kurz For. Fl. II. 178; Miq. Fl. Ind. Bat. II. 412. Cerbera fruticosa,

Ker Bot. Reg. t. 391; Roxb. Fl. Ind. I. 691, and ed. Carey & Wall. II. 526: Wall. Cat. 1583.

SINGAPORE: cultivated, Maingay (K.D.) 1055.—DISTRIB. Burma. This shrub is very commonly cultivated in Indian and Malayan gardens.

Var. albiflora, King & Gamble. Differs but little from the species, but has white flowers, a glabrous acutely pointed capsule, more oblong leaves, and rather larger corolla-lobes. Calpicarpum albiflorum, Teysm. & Binn. in Tijd. Ned. Ind. XXV. (1863) 402. See also Ridley in Trans. Linn. Soc. Ser. 2, III. 320.

SINGAPORE: Goodenough 59; King's Collector 1232; Ridley.— DISTRIB. Java, Ceram (Teysmann 5035).

2. Kopsia Pauciflora, Hook. f. Fl. Br. Ind. III. 639 (1882). A shrub (?): branchlets slender, pale brown, uppermost angled. Leaves chartaceous; elliptic or elliptic-lanceolate, obtusely caudate-acuminate at apex, acuminate at base; olivaceous-green and somewhat shining on the upper, yellowish and dull on the lower, surface; 4 to 6 in. long, 1.5 to 2.5 in. broad; midrib fairly prominent, impressed on the upper, much raised on the lower, surface; main nerves 6 to 10 pairs, distant, starting at an angle of 60° with the midrib and curving upwards to join in an obscure intramarginal nerve quite close to the edge; secondary nerves and transverse reticulations prominent on the lower surface; petiole 25 in. long, stout. Cymes terminal, few-flowered; the rachis ·25 to ·5 in. long, with many ovate-acute persistent bracts. Calux ·15 in. long; lobes ovate, obtuse, rather shorter than the tube. Corollatube very slender, cylindric, 1.5 to 2 in. long, villous inside, dilated at the top; lobes linear-oblong, 1 in. long, at length reflexed in flower. Anthers small, near the top of the tube. Fruit not known.

MALACCA: on Mount Ophir, Maingay (K.D.) 1056.

3. Kopsia Scortechini, King & Gamble, n. sp. A tree, reaching 40 to 50 feet in height; the branchlets swollen at the nodes. Leaves chartaceous; elliptic oblong, briefly acuminate at apex, unequally narrowed at base; somewhat shining on the upper, pale on the lower surface; margins slightly recurved; 2 to 5 in. long, 1 to 2 in. broad; midrib slender, impressed above, ending in a gland at the apex; main nerves 8 to 16 pairs, at an angle of about 70° with the midrib, curving upwards to join in an intramarginal nerve immediately close to the edge; reticulations inconspicuous; petiole ·1 in. long, glandular at the base inside. Cymes terminal, pseudo-terminal or lateral, on peduncles of varying (·25 to 2 in.) length; branches spreading, corymbose; bracts ovate-triangular, acute, ·1 to ·15 in. long, glabrous; pedicels short variable, each with a pair of small bracteoles; flowers large, white; buds clavate. Calyx-tube scarcely any; lobes ovate

acuminate, with a gland at the point behind, ciliate on the margins, 1 in. long. Corolla-tube slender, dilated at the top then constricted, 75 to 1 in. long, pubescent within below the stamens and half-way down; losses spreading, linear-oblong, 5 to 75 in. long. Anthers lanceolaste-acuminate, 1 in. long; filaments short. Disk-scales longer than carpels, broadened below, beaked above. Carpels glabrous; style very slender; stigma short, cylindric. Fruit not seen.

PERAK: Scortechini 1878.

4. Kopsia Griffithii, King & Gamble, n. sp. A small tree (?); branchlets pale brown, slender, enlarged at the nodes. Leaves coriaceous; ovate to ovate-oblong, abruptly obtusely caudate-acuminate at the apex, which is often emarginate, attenuate at the base; shining above, pale beneath; 3.5 to 5 in. long, 1.5 to 2 in. broad; midrib slender, prominent and channelled above; main nerves many (22 to 30 pairs), close, parallel, starting at an angle of about 70° with the midrib, and slightly curving to meet in an intramarginal nerve close to the edge, raised and prominent on the upper, less so in the lower surface; reticulations few; petiole 25 in. long, bordered by the decurrent margins of the blade, those of each pair of leaves embracing the branchlet so as nearly to meet. Cymes axillary and pseudo-terminal, sessile or on very short peduncles, corymbose; primary branches few and irregular in length and number of flowers (sometimes 1 flower only); bracts ovate-acute, very small, glabrous; pedicels slender, 4 to 6 in. long, with 2 to 3 minute bracteoles near the middle; flowers apparently large, white; buds long, clavate. Calyx-tube almost none; lobes nearly orbicular, 05 in. long, ciliate on the margins, a gland on the back near the top. Corolla-tube very slender, 1 to 1.5 in. long, inflated at the top, slightly pubescent within below the stamens; lobes ovate, ovate-oblong or oblong, obtuse, 75 to 1 in. long. Anthers lanceolate-acuminate. ·15 in. long; filaments short. Disk-glands subulate, slender. Carpels obtuse, densely long-hairy; style slender; stigma oblong, bifid. Fruit not seen.

MALACCA: Griffith.

Var. paucinervia, King & Gamble. A shrub, 4 to 6 feet high, flower very white. Similar to the species, but the leaves with fewer, 12 to 15 main nerves leaving the midrib at an angle of about 50° only, and not so abruptly or caudately acuminate. The carpels show the same shaggy hairs, and the disk-glands are the same.

PERAK: King's Collector 10707, in dense jungle, on limestone hills, at 500 to 800 feet.

5. Kopsia larutensis, King & Gamble, n. sp. A shrub reaching 10 feet in height, or a small tree up to 25 feet; branches pale brown,

rather smaller than a goose-quill, corky-barked and somewhat scurfy when dry. Leaves coriaceous; oblong-lanceolate, obtusely long caudateacuminate at apex, cuneate at base; margins recurved; upper surface shining, lower pale, both reddish when dry; 4 to 10 in. long, 1.5 to 2.5 in. broad; midrib stout, ending in a gland at the extreme apex; main nerves parallel, 15 to 22 pairs, impressed on the upper, raised on the lower surface, starting at an angle of about 70° to the midrib and gently curving upwards to meet in a looped intramarginal nerve close to the edge; secondary nerves and reticulations few; petiole very short or almost none, at most 2 in. long, stout, those of each pair of leaves joined by a slight ridge at the nodes. Cymes axillary or pseudo-terminal, sessile, few- (up to 10-) branched, very short at first but lengthening gradually to 5 in.; the branches covered with very small ovate-triangular densely imbricate bracts; flowers small, cream-coloured; buds clavate. Calyx-tube short; lobes ovate, obtuse. with a gland on the back near the top, ciliate on the margins. Corollatube cylindrical, slender, 3 to 4 in. long, slightly dilated at the top opposite the stamens, pubescent within; lobes spreading, much twisted. ·3 in. long, oblong-spathulate. Anthers lanceolate, apiculate, the bases rounded; filaments very short. Disk-glands subulate. Carpels 2, glabrous. Fruit of 2 (often only 1) urn-shaped capsules, triangular in shape, inflated on the dorsal, grooved on the ventral margin where they dehisce, ·7 in. long on the ventral margin, ·6 in. broad, ·25 in. thick, striate, beak sharp. Seeds 1, ovoid, ·4 in. long; testa membranous; albumen none; cotyledons fleshy, thick; radicle very small.

Perak: in low-lying woods near Larut, Wray 2736, 3956; Scortechini 57, 59, 1704; King's Collector 462, 2082, 4269, 6165.

6. Kopsia Ridleyana, King & Gamble, n. sp. A low shrub, reaching a foot or so in height; branchlets smooth, the size of a crow-quill. Leaves chartaceous when dry; lanceolate, obtusely acuminate at apex, cuneately attenuate at base; shining above, pale below; 4 to 4.5 in. long, 1 to 1.5 in. broad; midrib slender, ending in a gland at the apex; main nerves 12 to 14 pairs at an angle of about 60° with the midrib, curving upwards to meet in a slender looped intramarginal nerve, raised above as are the few secondary nerves and oblique reticulations; petiole .15 in. long, somewhat stem-clasping and slightly fimbriate-scaly at the base. Cyme terminal or apparently so, sessile, branches very few (2 to 3), about 3 to 5 in. long, furnished with many ovate-acute broadly sheathing glabrous bracts; flowers on very short pedicels, pure white; buds clavate. Calyx-tube very short; lobes ovate, obtuse or almost emarginate, with a gland on the back, glabrous, 1 to 15 in. long.

Corolla very slender, 1 in. long, dilated in the middle, pubescent at the mouth, glabrous within; lobes spreading, oblong-obovate, '75 in. long, '25 in. broad. Anthers lanceolate, acute, rounded at base, '1 in. long; filaments very short. Disk-glands subulate. Carpels 2, 2-celled, each cell 2-seeded; style very slender; stigma cylindrical, bilobed. Fruit not known.

NEGRI SEMBILAN: at Perhsutian Tinggi, Ridley 10093.

7. Kopsia Macrophylla. Hook, f. Fl. Br. Ind. III. 639 (1882). A shrub, 6 to 10 feet high; branchlets dark brown, the size of a goosequill, smooth. Leaves thinly coriaceous when fresh, chartaceous when dry: elliptic-oblong or oblong-obovate, obtusely short caudate-acuminate at apex, cuneate at base; margins only slightly or not recurved: upper surface light green with yellow towards the centre when fresh and with a metallic lustre when dry, lower surface pale brown, very minutely pubescent especially on the nerves; 5 to 9 in. long. 2 to 2.5 in, broad; midrib stout, ending in a gland at the apex; main nerves 18 to 22 pairs, raised on both surfaces, sometimes branched, at first straight and parallel, starting at an angle of about 55° with the midrib, then slightly curving to join in an intramarginal nerve close to the edge; secondary nerves few and reticulations prominent above when dry: petiole none or at most 1 in, long, those of each pair of leaves joined by a slight ridge at the node. Cymes pseudo-terminal, with a short (5 to 7 in.) stout peduncle and few, usually 2, thick branches. 1 to 3 in. long, densely covered with small broadly ovate pubescent imbricate ciliate bracts, 1 to 15 in. long; the branches not again branched: pedicels very short, stout; bracteoles 2, obtuse, ciliate, pubescent, under the calyx; flowers very white; buds clavate. Calyxtube very short; lobes 5, imbricate, oblong, obtuse or emarginate. with a gland on the back, minutely pubescent and ciliate, '1 in. long. Corolla-tube very slender, 1 in. long, dilated in the middle, glabrous within except for a slight ring below the anthers; lobes obovate, 5 to ·75 in. long, ·4 to ·5 in. broad, rounded. Anthers lanceolate, ·1 in. long; filaments very short, slightly pilose at base. Carpels rounded, minutely pubescent at apex; style slender. Fruit not seen, said to be pale green in colour.

PERAK: in rich soil on low ground, King's Collector 4963. SINGA-PORE: Lobb.

Haviland's No. 3042 from Borneo comes very near this, but the tube of the corolla is dilated near the top; the bracteate branches of the inflorescence are longer; and the leaves have a dark upper surface, more irregular main-nerves and the marginal nerve farther from the edge, and with another more slender outside it. But the material is insufficient for description.

Subtribe 3.—EUPLUMERIINÆ.

11. Alstonia. Br.

Trees or erect shrubs; branches often in whorls. Leaves usually whorled, rarely opposite, frequently with numerous nearly horizontal nerves; stipules sometimes represented by glands or a ridge between the leaf-petioles. Inflorescences of terminal or pseudo-terminal corymbose or umbelliform cymes, sometimes verticillate on the rachises. Calyx-tube short, sometimes urceolate, sometimes almost none; lobes 5, short, eglandular. Corolla hypocrateriform; tube cylindric, dilated opposite the stamens, usually at the top, the throat naked, annulate or with reflexed hairs; lobes overlapping either to the right or Stamens usually at the top of the tube, sometimes lower, included; anthers free, usually lanceolate; filaments short, filiform. Disk none, or annular or lobed; the lobes 2 alternate with the carpels. Carpels 2, distinct; style filiform; stigma oblong or cylindric, usually bifid at apex; ovules in each cell many, pluriseriate. Fruit of 2 follicular mericarps, usually long, cylindric, slender. Seeds oblong, compressed, peltate on flattened tough placentas, ciliate and usually with tufts of long hairs at the ends; testa membranous, often papillose; albumen fleshy, rather scanty; cotyledons oblong, flat; radicle about as long as the cotyledons, superior.—DISTRIB. Species about 30; found in India, Malaya, tropical Australia and Polynesia, one in tropical Africa.

Leaves with close parallel nerves, apex usually obtuse; corollalobes overlapping to the left; follicles over 6 in. long, equally broad throughout: seeds rounded at both ends (Sub-

	I. PALA)											
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Ovary villous; corolla-tube pubescent without; leaves 7 in. long

Ovary glabrous; corolla-tube glabrous without:-Corolla-tube rather broad; follicles glabrous; leaves 2 to

4 in. long

Corolla-tube slender; follicles pubescent; leaves 2.5 to 5 in. long 3. A. angustiloba.

Leaves with close parallel nerves, apex usually acute; corollalobes overlapping to the left; follicles under 6 in. long, broadest in the middle; seeds oblong, dentate at the ends (Subgenus II. BLABEROPUS)

Leaves with distant more or less parallel nerves; corolla-lobes overlapping to the right; follicles long, slender, equally broad throughout; seeds acute or acuminate at one end, rounded at the other (Subgenus III. DISSURASPERMUM):-

Stamens inserted at the top of the corolla-tube, which is

.. 1. A. scholaris.

2. A. spathulata.

.. 4. A. Curtisii.

nate at the other

glabrous without; leaves 5 to 12 in. long; main nerves 20 to 24 pairs; seeds rounded at one end, bifid and acute at the other 5. A Stamens inserted near the middle of the corolla-tube, which is pubescent without; leaves usually 4 to 6 in. long; main nerves 12 to 16 pairs; seeds rounded at one end, long-acumi-

.. 5. A. macrophylla.

.. 6. A. angustifolia.

IMPERFECTLY KNOWN.

7. A. GRANDIFOLIA. 8. A. PANGKORENSIS.

1. Alstonia scholaris, Br. in Mem. Wern. Soc. Edinb. I. 76 (1811). A large evergreen tree, reaching 60 feet or more in height and 6 feet or more in girth; stem buttressed; branches verticillate: branchlets smooth, swollen at the nodes; juice milky, bitter as is also the wood; glabrous except the inflorescence. Leaves coriaceous, verticillate, 4 to 7 in a whorl; oblong-obovate, oblong or elliptic-oblong, obtuse or sometimes shortly and bluntly acute, occasionally emarginate at apex, cuneate at base; bright green and shining above, white or grey glaucous beneath, 3 to 7 in. long, 1.5 to 2.5 in. broad; midrib thick; main nerves parallel, 30 to 40 pairs, at first almost at right angles to the midrib, slightly curving upwards to an intramarginal nerve close to the edge; secondary nerves many, similar but more slender; reticulations few; petiole stout, 25 to 75 in. long, with a hooked process on the upper side near the base. Inflorescence pseudo-terminal. Cymes umbellately branched; main peduncles stout, 3 to 5, variable in length, usually 2 to 3 in.; secondary peduncles slender, 5 to 7, supported often by a spathulate leafy bract; pedicels short; terminal flowers subcapitate; bracteoles oblong or ovate; flowers greenish-white; buds obovoid; whole inflorescence more or less tawny pubescent. Calyx-tube very short; lobes ovate, obtuse, ciliate, sometimes unequal in size. Corollatube cylindric, slightly enlarged below, much dilated at the top, hairy on both sides, 25 to 35 in. long, annulate within at the mouth; lobes ovate, obtuse, 15 in. long, cordate at base, rounded at top. Disk none. Anthers lanceolate, acute, rounded below; pollen-grains spherical, with small prominences. Ovary densely pale-villous; style slender; stigma cylindric, bifid at apex. Fruit of 2 follicles, 1 to 2 feet long and ·10 to ·15 in. broad, pendulous, terete. Seeds oblong, peltate, on a narrow placenta, flattened, 3 in. long, 075 in. broad, scabrous-papillose on both surfaces, reddish-brown, furnished at each end with tufts of slender tawny hairs up to 5 in. long; albumen very thin; cotyledons oblong, about ·1 in. long; radicle slender, as long as cotyledons. A. DC. Prodr. VIII. 408; Wall. Cat. 1644; Wight Ic. t. 422; Hook. f. Fl.

Br. Ind. III. 642; Miq. Fl. Ind. Bat. II. 436; Blume Bijdr. 1037; Brandis For. Fl. 325; Bedd. Fl. Sylv. t. 242; Kurz For. Fl. II. 183; Koord. & Val. Bijdr. I. 117; Trimen Fl. Ceyl. III. 133; Engl. & Prantl IV. i. 138, t. 53; Cooke Fl. Bomb. II. 132; Prain Beng. Plants, 672. Echites scholaris, Linn. Mant. 55. E. Pala, Ham. ex Spreng. Syst. I. 633; A. DC. l. c. 477.— "Pala," Rheede Hort. Mal. I. t. 45.

Penang: Wallich 1644a. Perak: Wray 170 (Vern. "Poko Palai"); Scortechini 601; King's Collector 7952. Malacca: Hervey. Singapore: Wallich 1644b. — Distrib. Throughout India, Ceylon and Burma, the Malay Archipelago, tropical Australia and Africa.

2. Alstonia spathulata, Blume Bijdr. 1037 (1834). A tree reaching 30 to 40 feet in height and 12 to 15 in. diam, (Scortechini and others), 60 to 100 feet in height and 3 to 4 feet in diameter (King's Collector 5263); glabrous; branches verticillate; branchlets smooth, swollen at the nodes. Leaves coriaceous; verticillate, 3 to 5 in a whorl; obovate or spathulate; rounded at the apex, or sometimes slightly obcordate; cuneate at base; bright green and shining above, whitish beneath, when dry both surfaces brown; margins recurved; 2 to 4 in. long, 1 to 2 in. broad; midrib stout, impressed above; main nerves raised above, 20 to 30 pairs, the lower ones horizontal, the upper gradually more and more curving upwards to meet in an intramarginal nerve close to the edge; secondary nerves few, similar; reticulations indistinct; petiole very short, bordered by the decurrent margin of the blade. Inflorescence pseudo-terminal. Cymes small, umbellately arranged in whorls; peduncle 1 to 2 in. long, stout, usually 1 only, sometimes 2 to 3; whorls of flowers 2 to 3, about 5 in. or less apart; pedicels slender, 25 to 5 in. long; bracts and bracteoles small, ovate-acute, caducous; flowers a "frosty" or "waxy" white; buds clavate. Calyxtube 05 in. long; lobes as long, orbicular, margins ciliate. Corollatube slender below, dilated above, 25 in. long, pubescent within, annulate at the throat; lobes oblong, twisted, 2 in. long, white villous within at the base. Anthers lanceolate, small; filaments very short; pollen-grains spherical with opposite round prominences. Disk none or very short. Ovary glabrous; carpels separate below, joined above; style slender, 15 in. long; stigma cylindric, bifid. Fruit of two follicles, 5 to 7, occasionally to 9, in. long, 1 to 15 in. broad, erect, terete, sometimes minutely pubescent. Seeds oblong, peltate, flattened, ·25 in. long, ·1 in. broad, ciliate and margined all round, nearly smooth on the faces, furnished at each end with tufts of slender tawny hairs up to .75 in. long; albumen scanty; cotyledons oblong, about 1 in. long; radicle as long as cotyledons, slender. A. DC. Prodr.

VIII. 410; Miq. Fl. Ind. Bat. II. 437; Hook. f. Fl. Br. Ind. III. 642; Koord. & Val. Bijdr. I. 121. A. cuneata, Wall. Cat. 1645

PERAK: in low marshy places and on river banks, Scortechini 1716; Wray 170 bis; King's Collector 400, 4009, 6852, 7464, 7780. MALACCA: Griffith; Maingay (K.D.) 1068; Derry 1064; Cantley 1937.—DISTRIB. Java, Borneo (Haviland, 1689, 3044).

Wallich's No. 1645 bears on the label, "e Sirmur," which is clearly a wrong habitat as mentioned by Hooker.

3. ALSTONIA ANGUSTILOBA, Miq. Fl. Ind. Bat. II. 438 (1856). A large tree reaching 60 to 100 feet in height and 3 to 4 feet in diameter; branches spreading, verticillate; branchlets dark brown, as thick as a goose-quill, terete. Leaves coriaceous, verticillate, 4 to 7 in a whorl, oblong or elliptic-oblong, shortly and obtusely acute at apex, attenuate at base: shining light green above, glaucous grey beneath; margins recurved; 2.5 to 5 in. long, 1 to 1.5 in. broad; midrib prominent; main nerves very many, 30 to 40, the lower ones parallel, at right angles to the midrib, the upper curved upwards, all meeting in the slightly thickened nerve-like margin, raised above; secondary nerves few, similar; reticulations very indistinct; petiole 5 to 75 in. long, channelled above, bordered by the decurrent margins of the blade. Inflorescence terminal, grey-pubescent, umbellate; peduncles stout, 1 to 5 together (usually 1 only), followed by a whorl of about 4 to 6 secondary branches, 25 to 5 in. long, bearing capitate clusters of many flowers on very short pedicels, and in addition 3 to 5 longer branches surmounted by similar capitate clusters or again whorled; bracts and bracteoles very small, ovate-acute, caducous; flowers dark red without, pale yellow within (K.C. No. 5270); buds narrow, linear, clavate, glabrous. Calyx-tube short; lobes ovate-acute, grey-pubescent, ciliate, together .06 in. long. Corolla-tube cylindrical, slightly dilated above, annulate at the mouth, glabrous without, pubescent within, 25 in. long; lobes narrow, linear-oblong, 15 to 2 in. long, with a small tuft of villous hairs at the base within. Disk none. Anthers lanceolate-acute; pollen-grains spherical, with 2 small spherical prominences opposite each other on different sides. Ovary glabrous; carpels distinct; style slender; stigma cylindrical, bifid at apex. Fruit of two grey-pubescent follicles, 6 to 8 in. long and barely 1 in. in diameter, erect, terete. Seeds flat, rectangular-oblong, 2 in. long, 05 in. broad, bordered, not papillose, furnished at each end with a tuft of long tawny hairs up to 5 in. long; albumen scanty; cotyledons oblong, narrow; radicle as long as cotyledons. Koord. & Val. Bijdr. I, 120.

Penang: Curtis 3087. Perak: Wray 4058; King's Collector 5263,

5270. Malacca: Griffith. SINGAPORE: Cantley 166; Ridley 8095 (var. glabra, Koord. & Val.).—DISTRIB. Java (Koorders 1 β , 14230), Borneo (Haviland 1732). Wray gives the vernacular name "Jelutong," Curtis "Getah Paule," Cantley "Gutta Pulei."

A leaf-specimen collected by G. King "halfway up Penanghill," in August, 1879, and another from Malacca, collected by Hervey in 1885, have "Leaves in whorls of 4 to 6, oblong-lanceolate, shortly and bluntly acuminate at apex, attenuate at base; green above, glaucous grey beneath; 4 to 6 in. long, 1 to 1.5 in. broad; main nerves very many, nearly 40, very regular and parallel; petiole rather slender, 25 to 6 in. long." They agree well with Teysmann's No. 994 from Loeboe Aloeng, Sumatra, Alstonia calophylla, Miq. Fl. Ind. Bat. II. 439.

4. Alstonia Curtisii, King & Gamble, n. sp. A dwarf compact shrub; branchlets slender, grey, ringed by the ridges marking fallen leaves. Leaves membranous when dry, in whorls of 3 to 4; oblanceolate, sharply acuminate at apex, attenuate at base; dull on both surfaces, pale beneath; margins recurved; 3 to 4 in. long, 75 to 1 in. broad; midrib slender; main nerves parallel, starting at about 70° to the midrib and curved upwards to the margin, 24 to 27 pairs, indistinct; secondary nerves similar, between the main nerves; reticulations very indistinct; petiole none or very short, bordered by the decurrent margins of the blade, with 2 to 3 small subulate glands on the upper surface at the base. Cymes pseudo-terminal, 1 to 2, few-flowered; peduncles short, 1 to 2 in. long; pedicels slender, 75 in. long; flowers white; buds long clavate with a swelling in the middle. Calyx-tube short; lobes as long as tube, 05 in., ovate-acuminate, hyaline at the margins, glabrous. Corolla-tube very slender, 1 in. long, dilated a little above the middle, glabrous without, slightly pubescent within below the stamens; lobes oblong-falcate, overlapping to the left in bud, 6 in. long, spreading, glabrous. Stamens inserted within the dilatation; anthers lanceolate, 15 in. long; filaments short; pollen globose. Disk of two subulate scales on broad bases alternate with the carpels. Ovary glabrous; style very slender; stigma cylindric, elongated (05 in.), bifid at apex; ovules very many. Fruit of two glabrous follicles, 3 to 3.5 in. long, 1 to 15 in. broad, acuminate at apex. Seeds oblong, peltate on a tough placenta, 25 in. long, 1 in. broad; margins scabrous, dentate, especially at the ends; testa covered with brown papillæ on the outer and with two ridges on the inner side; coma white, silky, very short at the sides, up to 15 in. long at the ends; albumen scanty.

Kasoom: limestone islands, Curtis 3242.

5. Alstonia macrophylla, Wall. Cat. 1648 (1829). A large tree, reaching 40 to 60 feet in height and 1 to 2 feet in diameter; branches stout, fleshy; branchlets more or less quadrangular and channelled on

the sides, marked with prominent leaf-scars. Leaves chartaceous: ternately verticillate, oblong-lanceolate or elliptic-lanceolate; shortly and abruptly acuminate at apex, cuneately attenuate at base for nearly half their length; light green above, pale and glabrous or sparsely brown-pubescent, especially along the nerves beneath; margins slightly recurved; 5 to 12 in. long, 1.5 to 3 in. broad; midrib slender; main nerves 20 to 24 pairs, parallel, starting at about 65° with the midrib and curving upward to meet in a very faint looped intramarginal nerve close to the edge, raised beneath; secondary nerves none; reticulations transverse, indistinct; petiole stout, 5 to 1 in. long, when young slender, base enlarged. Inflorescence pseudo-terminal, sessile: peduncles about 6 to 10, slender, 1 to 2 in. long, simple or occasionally branched, bearing spreading, many-flowered, 2- to 3-chotomous cymes: bracts none; bracteoles minute, ovate-acute; pedicels slender; cymebranches pedicels and calyx minutely grey-pubescent; flowers vellowishwhite: buds cylindric-clavate. Calyx-tube short, 03 in. long; lobes 5, ovate-acute, pubescent without, glabrous within except at the tips. Corolla-tube cylindrical below, slightly dilated above, glabrous without, sparsely pubescent within below the stamens, mouth contracted, 15 in. long; lobes oblong, rounded, folded in bud and overlapping to the right, as long as the tube, ciliate on the edges and villous at the base Stamens inserted at the top of the corolla-tube; anthers lanceolate, apiculate, rounded below; filaments short; pollen spherical. Disk annular, 025 in. deep. Ovary glabrous, ovoid, acute; carpels 2; ovules very many; style slender; stigma cylindric, bifid. Fruit of two pendulous follicles reaching 18 in. in length, about 1 to 2 in. in thickness, terete. Seeds peltate, on narrow, ribbon-like placentas, oblong, rounded below, slightly bifid and acute above, bordered by tawny hairs which are short at the sides and long plumose, up to 3 in., at the ends; testa very thin, papillose; albumen rather thick; cotyledons oblong, small; radicle as long as cotyledons. A. DC. Prodr. VIII. 409; Hook. f. Fl. Br. Ind. III. 643; Miq. Fl. Ind. Bat. II. 438. A. costata, Wall. Cat. 1649, not of Br.

Penang: Wallich 1648, 1649; Maingay (K.D.) 1066/2, 1070/2; Curtis 378; King's Collector 1637, 1732, 1733.—Distrib. Borneo, Philippines, New Guinea.

6. Alstonia angustifolia, Wall. Cat. 1650 (1829). A tall tree; branchlets dark brown, somewhat quadrangular and channelled, stout. Leaves nearly coriaceous, ternately whorled or opposite; obovate or oblanceolate, obtusely abruptly acuminate at apex, long cuneately attenuate at base for about half their length; glabrous and green above, pale and glabrous or when young pubescent beneath; margins slightly

recurved, 4 to 6 in. long, 1 to 1.75 in. broad; midrib slender, channelled above; main nerves 12 to 16 pairs, at an angle of from 60° to 70° to the midrib, curving upwards to meet in a very faint intramarginal looped nerve; secondary nerves few; reticulations many, transverse; petiole ·5 to 1 in. long. Inflorescence pseudo-terminal, sessile, grey-pubescent; peduncles 2 to 6, variable in length, usually from 1 to 2 in. long, ending in branched 2- to 3-chotomous corymbose spreading cymes; bracts none; bracteoles minute, triangular; pedicels slender, short but variable; flowers small, grey-pubescent, white (?), buds shortly clavate. Calyxtube urceolate, glabrous within, '05 to '1 in. long; lobes ovate, reflexed, pubescent on both surfaces, 005 in. long. Corolla-tube cylindric, slightly dilated a little above the middle, pubescent on both surfaces, ·125 in. long; lobes spreading, ·075 in. long, rounded, nearly glabrous within when open, except for the tuft of hairs above the base. Stamens inserted a little above the middle of the tube; anthers ovate, apiculate, ·035 in. long; filaments very short. Disk annulate, wavy at margin, very short. Ovary glabrous, ovoid-acute; style slender; stigma conical, penicillate below, bifid above. Fruit of two erect (?) follicles, reaching 18 in. in length and 15 in. in diameter, stiff, ribbed when dry. Seeds peltate, on narrow, ribbon-like, tough placentas, oblong, rounded below, long acuminate above, 4 in. long, 1 in. broad, bordered by tawny hairs which are short and reflexed at the sides and plumose at the ends, reaching 3 in. in length; testa thin, minutely papillose on the inner, villous on the outer surface; albumen flattened; cotyledons oblong, as long as the straight radicle. A. DC. Prodr. VIII. 409; Hook, f. Fl. Br. Ind. III. 643.

Penang: Griffith; Maingay (K.D.), 1066, 1067, 1070. Malacca: Derry 1080. Johore: Ridley 10942. Singapore: Wallich 1650; Kurz; T. Anderson 140; Ridley 2716, 5571.

Var. elliptica, King & Gamble. Leaves opposite or in whorls of three, elliptic, acute at apex and at base, glabrous except on the lower surface when quite young; 3 to 4 in. long, 1.25 to 1.75 in. broad; main nerves regular, raised beneath; petiole .75 to 1 in. long with a callus on the inner surface near the base; branchlets rough, dark brown.

Penang: Curtis. Scarcely a variety, but the shape of the leaves is very distinct.

VAR. latifolia, King & Gamble. Leaves larger, obovate, 5 to 7 in. long, 2·5 to 3 in. broad, glabrous. Flowers rather larger; calyx-lobes shallower. A small tree with spreading branches, reaching 15 to 20 feet in height and 3 to 4 in. in diameter.

Penang: Maingay (K.D.) 1070/1, 1070/2; Curtis 2491; Fox 80; Ridley 9306; Stoliczka; King's Collector 1341.

This species comes very near to A. villosa, Blume, of the Malay Archipelago, but we hesitate to join them, as there are important characters of difference, e.g., the very villous inside of the corolla-tube in A. villosa.

SPECIES IMPERFECTLY KNOWN.

7. Alstonia grandifolia, Miq. Fl. Ind. Bat. Suppl. 555 (1862). A lofty tree; the branchlets very stout, sharply angled, transversely rugose. Leaves chartaceous, in whorls of 4 to 6, those of each whorl usually more or less unequal; elliptic-oblong or obovate, acute at apex, gradually narrowed from the middle downwards at the base; brown and glabrous and somewhat shining on the upper, glaucous on the lower, surface; margin undulate; 7 to 13.5 in. long, 2.5 to 5 in. broad; midrib very stout, flat on the upper, much raised on the lower, surface; main nerves 20 to 30 pairs, very regular, parallel, at an angle of from 60° to 70° with the midrib, straight to the margin to meet a nerve which forms the margin itself, all raised beneath; secondary nerves very few, chiefly near the apex; reticulations transverse, forming an elegant network on the lower surface; petiole 1 to 1.25 in. long, stout. Follicles elongate, woody (Miq.). Rest unknown.

SINGAPORE: T. Anderson 119.—DISTRIB. Sumatra (Teysmann).

- A. eximia, Miq., l.c., seems to differ only in the main nerves being more nearly at right angles (80°) with the midrib. It also comes from Sumatra.
- 8. Alstonia pangkorensis, King & Gamble, n. sp. A large tree (?); branches very stout, smooth, somewhat fleshy, grey. Leaves membranous; obovate or oblanceolate, abruptly and shortly and bluntly acuminate at apex, cuneate at the base for the lower two-thirds; glabrous above, minutely pubescent beneath, especially on the nerves; margins recurved; 12 to 14 in. long, 4 in. broad; midrib very stout, impressed above, strongly raised beneath; main nerves about 18 pairs, stout, parallel, raised beneath, usually about '75 in. apart along the midrib, starting at an angle of about 75° and gently curving upwards to the margin; secondary nerves few; reticulations bold, fairly prominent on the lower surface; petiole stout, about '75 in. long. Follicles very slender, 10 to 12 in. long, glabrous, striate, the margins reflexed after the fall of the seeds. Rest unknown.

DINDINGS: Pangkor Island, Scortechini 1024.

12. Dyera, Hook. f.

Glabrous trees with verticillate branches and thick angular channelled branchlets, laticiferous. Leaves in whorls, large, coriaceous, oblong or obovate, with prominent main nerves and long petioles;

stipular ridges between the petioles. Inflorescence of pseudo-terminal and axillary umbellately branched cymes; flowers small. Calux 5-lobed. very small, eglandular; tube very short, adnate to the base of the ovarv. Corolla hypocrateriform, 5-lobed; tube short, hardly dilated opposite the stamens; the throat naked; lobes 5, folded in bud and overlapping to the left. Stamens 5, in the middle of the tube, included: filaments very short; anthers oblong-ovoid; cells small; the connective produced in a thickened terminal fleshy appendage. Disk annular. obscure. Ovary 2-celled, short, entire, conic, obtuse at the top, which is pubescent; style none or minute; stigma obpyriform, minutely bifid at apex: ovules many in each cell on intruded placente. Fruit of two cylindric follicular mericarps of very large size, connate at the base, at first divergent, afterwards curling back and opening flat. Seeds elliptic. large, flat, peltate, surrounded by a broad membranous striate wing, longer at the ends than in the middle; testa very thin, glandularpapillose; albumen flat, rather scanty; cotyledons elliptic, very thin; radicle small, superior.—DISTRIB. Three species, of the Malay Peninsula and Archipelago.

1. Dyera costulata, Hook. f. in Journ. Linn. Soc. XIX. 293 (1882). A very large tree, reaching 100 to 150 feet in height and 3 to 4 feet in diam.; branches verticillate with reddish thick bark; branchlets thick, angular and channelled, at any rate when dry. Leaves coriaceous, in whorls of 6 to 8; broadly elliptic or elliptic-oblong, rounded and sometimes very shortly and abruptly acute at apex, rounded at base or sometimes attenuate: upper surface bright green shining, lower pale bluishgreen glaucous, especially when young; margins somewhat undulate, slightly recurved; 3 to 7 in. long, 1.5 to 3 in. broad; midrib stout, very prominent beneath, impressed and keeled above; main nerves 16 to 20 pairs, at first nearly at right angles to the midrib, then curving upwards to join in a looped nerve at the margin, raised on both surfaces when dry, as are the prominent reticulations; petiole 1 to 1.25 in. long, ribbed, furnished with a rounded cone-like gland on the upper surface at the base, the glands of the uppermost whorl of leaves conniving in a cone over the bud. Cymes pseudo-terminal, or from the penultimate leafwhorl; peduncles of varying length, 1 to 3 in. long, rather slender branches umbellately whorled; secondary peduncles 25 to 5 in. long; pedicels slender, short; bracteoles triangular, minute; flowers yellowish; buds linear-oblong. Calyx-tube adnate to the base of the ovary; lobes ovate rounded, glabrous, 6 in. long. Corolla-tube short, 1 in. long, glabrous, except a ring of scanty reflexed hairs within near the base below the insertion of the filament; narrow raised folds between the stamens; lobes oblong, cordate at base, folded in bud, rounded at top, 15 in. long. Stamens inserted a little above the base of the corolla-tube; pollen globose with small pits. Follicles very large, on greatly thickened peduncles (5 in. in diam.), 9 to 15 in. long, 1 to 1.5 in. broad, after splitting open nearly 3 in. broad, connate at the base, at first straight, but after dehiscence curved backwards so as nearly to touch at the points. Seeds peltate, flat, elliptic, surrounded by a membranous striate wing, broader at the ends than in the middle. 2.5 in. long, 1 in. broad, the seed part 1.25 by .75 in.; testa thin, granular-papillose; albumen thin; cotyledons ovate, 7 by 4 in., very thin and difficult to separate; radicle short. Fl. Br. Ind. III. 644. Alstonia? costulata, Mig. Fl. Ind. Bat. Suppl. 556.

Penang: Curtis 339I; Scortechini 1973; King's Collector 4689, 8181, 8784. Malacca: Griffith; Maingay (K.D.) 1097; Derry 554. Pahang: in Tahan Woods, Ridley in Trans. Linn. Soc. 2nd Ser. III. 320. Singapore: Ridley 4922. — Distrib. Sumatra (Teysmann, Diepenhorst 1114).

This is the chief plant that gives the "Gutta Jelutong," which seems, however, to be used only as an adulterant of the true Guttas given by species of Palaquium and Payena. Beccari, in 'Nelle foreste di Borneo,' 561, says that the Gutta of the allied Bornean species Dyera Lowii, Hook. f., is absolutely wanting in elasticity, and quickly resinifies and becomes pulverulent.

2. Dyera laxiflora, Hook f. Fl. Br. Ind. III. 644 (1882). A very large tree, reaching 100 to 150 feet in height and 3 to 4 feet in diam.; branches verticillate; branchlets angular, furrowed, rugose, very thick, dark brown. Leaves chartaceous, in whorls of 4 to 7; elliptic-obovate or obovate, rounded or shortly acute at apex, rounded at base or especially when young cuneate-attenuate; upper surface bright green glossy, lower glaucous; margins slightly recurved; 6 to 8 in. long, 2 to 3.5 in. broad; midrib prominent, depressed and keeled above, much raised beneath; main nerves 13 to 17 pairs, starting at an angle of about 60° with the midrib, and only very slightly curving upwards to meet in a looped nerve at the margin, slightly impressed above, raised beneath; reticulations many, prominent on both surfaces; petiole 1 to 2 in. long, channelled, furnished at the base with a prominent gland, which, especially those of the uppermost whorl, is recurved, hooked,

and forms a cone over the bud. Cymes from the penultimate whorl of the branchlets; peduncles 2 to 5 in. long, slender; branches umbellately whorled; secondary peduncles slender, '75 to 1 in. long; pedicels very slender, about '2 to '3 in. long; bracts leafy, orbicular, petioled, caducous; bracteoles very small, triangular; flowers white; buds linear-oblong. Calyx-tube adnate to the lower part of the ovary; lobes orbicular, rounded or sometimes emarginate, glabrous, '05 in. long. Corolla salver-shaped; tube urceolate, ribbed without, '075 in. long, glabrous, except a ring of reflexed hairs below the insertion of the filaments; lobes oblong, rather narrow in bud, broad in flower, reaching '2 in. in length and '1 in. in breadth. Ovary pubescent on top; stigma sessile, bilobed. Fruit not known.

PERAK: Wray 541; King's Collector 7852 (or 4?). SINGAPORE: Murton; Burbidge; Cantley 226; Ridley; Hullett 343. Vern. name, "Kayu (wood) Jelutong" (Wray).

13. Holarrhena, Br.

Trees or shrubs. Leaves opposite, usually membranous, glabrous or pubescent, penninerved. Flowers white, in terminal or axillary or sub-axillary corymbose cymes. Calyx 5-fid or 5-partite; lobes narrow, usually glandular at the base on one or both sides. Corolla hypocrateriform; tube slender, cylindric, slightly dilated opposite the stamens; the throat contracted, naked; lobes 5, oblong, overlapping to the right. Stamens included in the tube near the base; anthers lanceolate mucronate; cells rounded at the base; filaments short, slender. Disk none. Ovary of 2 distinct carpels; style shortly filiform; stigma below the anthers oblong-fusiform, tip entire or bifid; ovules many in each carpel. Fruit of 2 elongate, terete, follicular mericarps. Seeds oblong or linear, concave inside, the funicle in the concavity; tipped with a deciduous coma of slender hairs; albumen scanty; cotyledons broad, complicate; radicle short.—Distrib. Species 8; 5 in tropical Africa, 3 in India and Malaya.

Leaves over 4 in. long and 2 in. broad, membranous, main nerves irregular; follicles 10 to 15 in. long; cymes broad

1. H. antidysenterica.

Leaves under 4 in. long and 2 in. broad, chartaceous, main nerves regular; follicles 6 in. long; cymes narrow

.. 2. H. Curtisii.

1. Holarrhena antidysenterica, Wall. Cat. 1672 (1828). A small tree, glabrous or pubescent; the branchlets slender, lenticellate. Leaves membranous, variable; ovate or ovate-oblong to elliptic, obtusely acuminate at apex, rounded or attenuate or cuneate often unequally at base; glabrous above, glabrous or more or less pubescent beneath;

4 to 8 in. long, 2 to 4 in. broad; midrib slender in the glabrous-leaved, broad in the pubescent-leaved forms; main nerves 10 to 14 pairs, irregular, at about 50° with the midrib, curved upwards to and along the margin where they anastomose; secondary nerves few or none: reticulations irregular, not prominent; petiole 1 to 2 in. long, sometimes none. Cymes many-flowered, dichotomous, 3 to 6 in. in diameter, sessile or shortly peduncled; pedicels slender, 25 to 5 in. long; bracts small, lanceolate, pubescent or glabrous, ciliate; buds clavate; flowers white. Calux-lobes linear-lanceolate, 1 to 2 in. long, ciliate, glandular at base or not; tube scarcely any. Corolla-tube slender, 3 to 4 in. long, puberulous, slightly inflated at base; mouth contracted; lobes oblong, acute or rounded at top, infolded in bud, ciliate, 4 in. long. Anthers mucronate. Ovary glabrous; style short; stigma fusiform. Follicles 10 to 15 in. long, 2 in. broad, terete, black, often dotted with white spots, diverging below, then incurved. Seeds linear-oblong, channelled on the inner, rounded on the outer, face, 5 to 6 in. long, flattened at the hilum; coma golden-brown, 75 to 1 in. long; cotyledons cordate at base, 4 in. long; radicle 1 in. A. DC. Prodr. VIII. 413; Brandis For. Fl. 326, t. 40; Bedd. Fl. Sylv. CLX. tab. xx. 6; Kurz For. Fl. II. 182; Hook, f. Fl. Br. Ind. III. 644; Cooke Fl. Bomb. II. 133; Prain Beng. Pl. 674. H. Codaga, G. Don Gen. Syst. IV. 78; A. DC. l. c. 414; Kurz l. c. 181; Wight Ic. 1297. H. malaccensis, Wight Ic. 1298; Miq. Fl. Ind. Bat. II. 441. H. pubescens, Wall. Cat. 1673; A. DC. l. c. 413; Miq. l. c. 440. Echites antidysenterica, Roxb. Chonemorpha (?) antidysenterica, G. Don l.c.; Wight Ic. 439. "Codaga-Pala," Rheede Hort. Mal. I. t. 47.

MALACCA: Capt. Wight cf. Wight Ic. 1298.—DISTRIB. India and Burma.

There are available in the Herbaria of Kew and Calcutta sheets of only one specimen, which is that collected by Capt. Wight, and which was figured in the 'Icones' as H. malaccensis. It is a specimen of the glabrous form of the tree, as was to be expected, that being the more usual form in the damp regions of India, as is the pubescent one in the dry regions.

2. Holarbhema Curtish, King & Gamble, n. sp. A shrub, reaching 8 feet in height; branchlets slender, dark brown, smooth; innovations pubescent. Leaves chartaceous; oblong or oblong-lanceolate or obovate, acute or rounded at apex, attenuate and rounded at base; shining above, pale beneath and minutely pubescent; the margins recurved; 1.5 to 3.5 in. long, .75 to 1 in. broad; midrib thick, prominent beneath; main nerves 12 to 14 pairs, regular, at about 45° with the midrib, curving upwards to and along the margin, raised beneath; secondary

nerves occasional; reticulations minute; petiole 1 to 15 in. long, bordered by the decurrent margins of the blade. Cymes axillary. corymbose, pubescent, 1.5 to 2.5 in. in diameter, on peduncles 5 to ·75 in. long; bracts linear-oblong or spathulate; bracteoles linear. ·15 in. long, on the pedicels below the flower; pedicels slender: flowers white; buds clavate. Calyx-lobes linear-oblong, 25 in. long, rounded or acute at top, ciliate, pubescent, with 2 glands at the base within: tube almost none. Corolla-tube slender, slightly inflated near the base opposite the stamens, contracted at the mouth, 4 in. long, ciliate on the edges, pubescent on both surfaces; lobes oblong, rounded at top. narrowed at the base, the margins infolded in bud, pubescent on both sides. Anthers 05 in. long, mucronate. Ovary of 2 distinct glabrous carpels; style very short; stigma fusiform, bifid, below the anthers. Follicles brown, straight, terete, 6 in. long, 2 in. broad, only little divergent. Seeds oblong, keeled on one side, concave on the other, ·4 in. long; coma golden-brown, up to 1.5 in. long.

SIAMESE STATES: Trang, at 100 to 200 feet, Kunstler 1402; Curtis 3392. — DISTRIB. N. Siam (F. H. Smiles), Cambodia (Godefroy-Lebœuf 189).

14. ERVATAMIA, Stapf.

Shrubs or small trees, usually glabrous; branchlets usually dichotomous. Leaves opposite, herbaceous to coriaceous, usually membranous when dry; axillary stipules usually distinct; axillary glands small, often numerous. Flowers small to middle-sized, sometimes showy, in terminal, pseudo-terminal or axillary cymes, usually corymbose and often in pairs; branches dichotomous. Calyx small; lobes 5, free or connate at the base, glandular or not within. Corolla salver-shaped; tube cylindric, slightly dilated at the mouth or rarely lower, opposite the stamens; lobes overlapping to the left, rarely to the right. Stamens erect, included; filaments short, usually decurrent in ridges inside the tube; anthers linear, bilobed at base, acute or mucronate, dehiscing throughout their length. Disk 0. Ovary of 2 carpels, distinct or slightly cohering; style long, filiform; stigma clavate, with a slender bifid apiculus; ovules numerous, pluriseriate. Fruit of two follicular mericarps, obliquely ovoid to lanceolate or cylindric-lanceolate, often curved and beaked, sometimes 1- to 3-keeled; dehiscing along the ventral suture and at length often opening out flat. Seeds few to many, enveloped in a bright-coloured aril, more or less irregularly ellipsoid, grooved or hollowed ventrally; testa crustaceous, finely sulcate, the furrows protruded into the copious often waxy albumen; cotyledons flat, cordate; radicle cylindric.—DISTRIB. Species about

30 to 35 in tropical Asia, Australia, and Polynesia; 1 species in Madagascar.

Leaves with main nerves curving upwards; stamens near the top of the corolla-tube:-Leaves chartaceous or coriaceous; branchlets stout; calyxlobes thick, broad, short:-Cymes glabrous or very slightly pubescent .. 1. E. corymbosa. 2. E. hirta. Cymes hirsute . . . Leaves membranous; branchlets slender:-Calyx-lobes very small, under '1 in. long:-Calyx-lobes ovate, acute; follicles oblong, keeled, beak slightly recurved; seeds 3 to 6 .. 3. E. coronaria. Calyx-lobes ovate, rounded; follicles twisted, beak much 4. E. peduncularis. recurved; seeds 1 to 2 Calyx-lobes lanceolate, over ·1 in. long :-Calvx-lobes over 3 in. long; follicles 1.5 to 3 in. long, narrowly cylindric, not keeled ... 5. E. cylindrocarpa. Calvx-lobes ·15 to ·2 in. long; follicles ·75 to 1·25 in. long, oblong falcate, 3-keeled ... 6. E. malaccensis. Calvx-lobes 1 to 15 in. long; follicles 1 to 1.5 in. long, ovoid, long-acuminate, not keeled .. 7. E. Curtisii. Leaves with main nerves at right angles to midrib and straight or very slightly curving; branchlets stout; stamens near the middle of the corolla-tube 8. E. polyneura.

1. ERVATAMIA CORYMBOSA, King & Gamble. A shrub or small tree. reaching 30 to 40 feet in height and 8 to 10 in. in diameter; branchlets stout, smooth, uppermost internodes somewhat flattened. Leaves chartaceous; elliptic-oblong or elliptic-lanceolate, obtusely acuminate at apex, cuneately narrowed at base; dark green above, pale beneath; margins sometimes slightly recurved; those of each pair often very unequal in size; 6 to 16 in. long, 2 to 6 in. broad; midrib stout, raised beneath; main nerves 12 to 16 pairs, leaving the midrib at an angle of 65° to 75° and at first nearly straight, then curving upwards to and along the margin, usually impressed above and strongly raised beneath; reticulations few, inconspicuous; petiole stout, 5 to 8 in. long, base enlarged half-stem-clasping; axillary glands prominent, meeting at the nodes. Cymes many-flowered, much-branched, usually in pairs in the axils of the second uppermost pair of leaves, di-tri-chotomous; peduncles variable, 5 to 25 in. long, stout; secondary peduncles similar, 1 to 1.5 in. long; pedicels slender, .5 to 1 in. long, somewhat clavate; bracts obsolete; flowers spreading, corymbose, waxy cream-colour; buds clavate, the top large, globose, often minutely grey-pubescent. Calyxtube campanulate, 5 in. long, thick; lobes ovate, rounded, ciliate, 1 in. long; glands, if present, two at the base of the lobes inside. Corollatube cylindric, slender, slightly dilated at top, opposite the stamens, ·75 in. long; lobes oblong-falcate, ·5 in. long or rather more; pubescent without, crispate on one edge and auricled on that edge at the base. Anthers linear-oblong, blunt or mucronate, ·125 in. long, the basal lobes adherent to the connective; filaments short, decurrent in lines inside the corolla-tube. Ovary of 2 ovoid, glabrous carpels; style filiform; stigma clavate, tip entire or bifid. Follicles thick, globular-ovoid, recurved, very shortly beaked, obtusely keeled, rough outside, 1·5 in. long, 1 in. in diameter; ventral suture impressed. Seeds very many, oblong-obtuse, deeply hollowed ventrally, ·5 in. long, ·2 to ·25 in. broad and deep; testa crustaceous, glandular-papillose, with deep ridges within, which extend into the copious albumen; cotyledons cordate, ·15 in. long; radicle cylindric, ·25 in. long. Tabernæmontana corymbosa, Roxb. Fl. Ind. II. 25; A. DC. Prodr. VIII. 376; Wall. Cat. 1772 and Bot. Reg. under t. 1273; Hook. f. Fl. Br. Ind. III. 646; Miq. Fl. Ind. Bat. II. 420.

PENANG: Wallich 1572; Phillips; Curtis 1763. PROVINCE WELLESLEY: Ridley 7032. PERAK: Wray 4169; King's Collector 3141, 3522, 5792, 5999, 7163, 7376. MALACCA: Griffith. Johore: at Jaffaria, G. King. Singapore: T. Anderson 82, 117; Murton 115; Ridley 4119, 8416, 8431.

VAR. Kelsalli, King & Gamble. Leaves thinner than in the type, oblong-lanceolate; main nerves fewer (10 pairs) and at a more oblique angle (50°). Cymes nearly sessile, much fewer-flowered.

SELANGOR: at Bukit Etam, Kelsall 1992.

VAR. pubescens, King & Gamble. Inflorescence covered with slight greyish-yellow pubescence.

PERAK: King's Collector 4830. MALACCA: Goodenough 1638.

This is scarcely a variety. In many of the specimens of the species the corolla in bud is thickly tomentose outside, and thus we have a gradation from the glabrous to the pubescent form.

2. Ervatamia hirta, King & Gamble. A large shrub (?); branchlets stout, somewhat flattened, dark brown, lenticellate. Leaves coriaceous; elliptic-ovate or -oblong, long acuminate at apex, acute at base; dull on both surfaces, dark olivaceous-brown on the upper, much paler on the lower; margins recurved; 4 to 12 in. long, 2.5 to 5 in. broad; midrib rather slender, flattened on the upper, raised on the lower surface; main nerves 10 to 15 pairs, starting at about 70° with the midrib and curving upwards to anastomose near the margin, impressed above, raised beneath; secondary nerves apparently none; reticulations obscure; petiole 25 to 5 in. long, stout. Cymes almost hirsute, many-flowered, much branched, usually in pairs in the axils of

the second uppermost pair of leaves, 2- to 3-chotomous; peduncles flattened, curved, 1.25 to 1.75 in. long; secondary peduncles similar but rather shorter; pedicels slender, about 5 in. long; bracts and bracteoles obsolete; buds clavate, reaching 75 in. long, nearly glabrous, the top globose. Calyx sometimes 7-lobed, cup-shaped, eglandular, hispid without, glabrous within; tube 15 in. long; lobes ovate-acute, as long as tube. Corolla-tube cylindric, 5 in. long, slightly inflated opposite the stamens near the top, glabrous; lobes oblong-falcate, crispate on one edge and auricled on that edge near the base, much twisted to the right, 25 in. long (in bud). Anthers lanceolate, with a hooked mucro at tip, 075 to 1 in. long, the basal lobes adherent to the connective; filaments short. Ovary of 2 ovoid glabrous carpels; style filiform; stigma clavate, with a slender, usually bifid tip. Follicles ovoid, falcate, recurved, obscurely keeled and obtusely beaked, 1 to 1.5 in. long by 5 to 75 in. broad, smooth outside, ventral suture impressed before dehiscence. Seeds many, crescent-shaped, deeply hollowed ventrally, 5 in. long, 25 in. broad and deep; testa crustaceous, ribbed. and with deep ridges which extend into the albumen; cotyledons ovate, 05 in. long; radicle slender, 1 in. long. Tabernæmontana hirta. Hook, f. Fl. Br. Ind. III. 646.

MALACCA: Griffith; Maingay (K.D.) 1059; Derry 77.

This species comes near to E. corymbosa var. pubescens, but the hirsute inflorescence at once distinguishes it

3. ERVATAMIA CORONARIA, Stapf in Dyer Fl. Trop. Afr. iv. 127 (1902). A shrub; branches many, dichotomous, corky, pale brown. Leaves membranous; lanceolate or oblanceolate or oblong-lanceolate, longacuminate at apex, acuminate at base, the pairs often unequal-sized; deep green on the upper, paler on the lower surface; 3 to 6 in. long, .75 to 1.5 in. broad; midrib slender; main nerves 7 to 9 pairs, distant, curving upwards to and along the margin; secondary nerves and reticulations indistinct; petiole 3 to 4 in. long, slender, the base half-stem-clasping: axillary glands present. Cymes few- (2- to 10-) flowered; peduncles 1.5 in. long; pedicels slender, about .25 in. long; bracteoles minute, usually 2 to each pedicel, one below the calyx, one lower down; flowers white, fragrant; buds clavate. Calyx-tube short; lobes ovate, acute or rounded, ciliate, biglandular within. Corolla-tube slender, .7 to .9 in. long, scarcely dilated slightly below the middle opposite the stamens, pubescent within below the stamens; mouth with flattened glands; lobes as long as the tube, ovate-oblong, obtuse, one edge slightly crispate. Anthers lanceolate, 05 in. long, minutely hooked at tip; filaments hairy. Ovary of 2 glabrous earpels; style short; stigma cylindric, bifid

at tip. Follicles spreading at about 90° to 100° apart, oblong, 1 to 2 in. long, with 1 to 3 keels and a recurved acuminate tip, opening out flat when fully ripe. Seeds 3 to 6, irregularly oblong, angular, 25 in. long, enclosed in a red pulpy aril; deeply grooved ventrally with a hranching groove; testa crustaceous, sulcate, glandular, the furrows protruded into the albumen, which is copious; cotyledons ovatecordate, 1 in. long; radicle cylindric, as long as the cotyledons. Cooke Fl. Bomb. II, 134. Tabernæmontana coronaria, Willd. Enum. Hort. Berol. 275; Ait. Hort. Kew. ed. 2, II. 72; A. DC. Prodr. VIII. 373; Roxb. Fl. Ind. II. 23; Wall. Cat. 1568; Wight Ic. 477; Lodd. Bot. Cab. t. 406; Lindl. in Bot. Reg. t. 1064; Dalz. & Gibs. Bomb. Fl. 144; Miq. Fl. Ind. Bat. II. 421; Brandis For. Fl. 322; Bedd. Fl. Sylv. CLIX.; Hook. f. Fl. Br. Ind. III. 646; Trimen Fl. Ceyl. III. 133; Prain Beng. Plants 673. T. divaricata, Blume Bijdr. 1626; Kurz. For. Fl. II. 174. Nerium divaricatum, Linn. Sp. Pl. 306. N. coronarium, Jacq. Coll I. 138, t. 52; Bot. Mag. t. 1861. Jasminum zeylanicum. Burm. Fl. Ind. t. 39.

KASOOM: Curtis 3243. Penang: back of West Hill at 2000 feet, Curtis 3460. Perak: King's Collector 5153. Malacca: at Bukit Burang, Goodenough 1423. Singapore: Wallich 1568.—Distrib. Apparently wild in N. India. The shrub is commonly cultivated in gardens throughout India and Malaya.

4. ERVATAMIA PEDUNCULARIS, King & Gamble. A small shrub (small tree, King's Collector); branchlets slender, dichotomous, curved. Leaves membranous; elliptic or elliptic-oblong or oblong-lanceolate. obtusely long caudate-acuminate at apex, acute at base; glabrous, pale beneath; 4 to 9 in. long, 1.5 to 3 in. broad; midrib slender; main nerves 12 to 20 pairs, parallel, starting at an angle of about 60° with the midrib and curving upwards to join in an intramarginal looped nerve; secondary nerves none; reticulations transverse, faint; petiole ·25 to ·4 in. long, slender at first, afterwards thickening, the base enlarged, half-stem-clasping with a stipular scale within. Cymes glabrous, usually in pairs, axillary, on 2 to 5 in. long slender peduncles; branches widely divaricate; secondary peduncles .75 to 1 in. long; pedicels capillary, 2 to 3 in. long; bracteoles minute; flowers white; buds slender, clavate. Calyx-tube short; lobes ovate, rounded, glandular within on the middle, 025 in. long. Corolla-tube very slender, straight or slightly curved, 4 to 5 in. long, inflated at the top opposite the stamens; mouth naked, slightly pubescent within below the stamens. Anthers lanceolate, slightly mucronate. Ovary of 2 glabrous carpels; carpels elongate; style very slender; stigma clavate, bifid at apex just beneath the anthers. Follicles stipitate, twisted, oblong or rhomboid,

beaked; the beak recurved, '4 to '6 in. long, '4 in. broad, 1- to 2-seeded. Seeds bluntly angled, enclosed in a thin red fleshy aril; testa crustaceous, sulcate, the furrows pressing inwards, rough, glandular; albumen copious; cotyledons cordate, '15 in. long; radicle cylindric. Tabernæmontana peduncularis, Wall. Cat. 1575 and in Bot. Reg. under t. 1273; A. DC. Prodr. VIII. 376; Miq. Fl. Ind. Bat. II. 421; Hook. f. Fl. Br. Ind. III. 647.

Kedah: at Langkawi Island, Curtis 2536. Penang: Porter (Wallich 1575); Maingay (K.D.) 1060/2; Curtis 790. Perak: Curtis; Wray 1892, 1962, 1975; Scortechini 83, 226, 724; Ridley 9750; King's Collector 846, 1858. Selangor: Ridley 8555. Malacca: Derry 1014.

5. ERVATAMIA CYLINDROCARPA, King & Gamble, n. sp. A shrub reaching 4 to 6 feet in height; branchlets slender, dichotomous, pale brown, smooth. Leaves membranous; lanceolate, oblong-lanceolate, or elliptic-lanceolate, sharply or sometimes bluntly caudate-acuminate at apex, the acumen curved sideways, attenuate at base; light green above when young, darker when old, paler beneath; 4 to 7 in. long, 1 to 2.5 in. broad; midrib slender; main nerves 7 to 10 pairs, starting at an angle of about 60° to 70° with the midrib, and at once curving upwards to anastomose a little short of the margin; secondary nerves few; reticulations inconspicuous; petiole 25 in. long, slender. Cymes axillary or terminal, single or in pairs, divaricately branched; peduncles slender, 5 to 1 in. long; secondary peduncles as long, dichotomously branched; pedicels slender, 25 to 5 in. long; bracteoles minute, very caducous; flowers few in each cyme, waxy white with a yellow centre; buds rather stoutly clavate, acute at tip. Calyx-tube very short; lobes lanceolate or linear-lanceolate, unequal, 3 to 4 in. long, acute, with large glands inside near the base, midrib prominent. Corolla-tube funnel-shaped in bud, cylindric in flower; dilated above opposite the stamens, 4 to 5 in. long, glabrous on both surfaces; lobes oblong, spreading, rather broad, 5 in. long, rounded at top. Anthers linear-acute, 'I in. long; pollen-grains globose, with projecting bosses. Ovary of 2 carpels, rounded at top; style slender; stigma clavate. with a bifid point. Follicles widely divaricate, from 110° to nearly in the same line, cylindric, acute both at base and tip, scarcely recurved. 1.5 to 3 in. long, not keeled. Seeds up to 10, ovoid, 3 in. long, sulcate ventrally, enclosed in a fleshy aril; testa crustaceous, glandular, ribbed. the ribs extending into the copious albumen; cotyledons cordate; radicle cylindric.

Perak: Wray 158, 1857, 2806, 3117, 4027; Scortechini 144, 438, 920, 964; King's Collector 1060, 2081, 3006, 10061, 10264. DINDINGS: Ridley, 7935, 8360, 8631, 10291.

6. ERVATAMIA MALACCENSIS, King & Gamble. A slender glabrous

shrub, reaching 6 to 8 ft. in height; branchlets slender, dichotomous, smooth. Leaves membranous; lanceolate to elliptic-obovate, obtusely caudate-acuminate at apex, the acumen often twisted sideways, attenuate at base; yellowish-green when fresh, pale brown when dry; 1.5 to 4 in. long, 5 to 1.5 in. broad; midrib slender, raised beneath; main nerves very slender, 6 to 9 pairs, starting at an angle of from 50° to 60° with the midrib, and curving upwards to join in an inconspicuous intramarginal looped nerve; secondary nerves very few; reticulations few. faint; petiole 5 to 25 in. long, winged by the decurrent margins of the blade, half-stem-clasping at base with a stipular ridge at the node and a ligule-like gland within. Cymes axillary, sessile or shortly peduncled, few- (1- to 6-) flowered; pedicels slender, curved, 25 to 75 in. long; bracteoles minute, caducous; flowers white with a yellow centre, or pale yellow; buds very slender, clavate, rounded at top. Calyx-tube short; lobes lanceolate, acuminate, glandular within, unequal, 15 to ·2 in. long, with a strong midrib nerve. Corolla-tube very slender, dilated at top opposite the stamens and there twisted, 5 to 7 in. long, glabrous except for a slight pubescence within below the anthers; lobes narrow, oblong, folded in bud, crisped on the margins, 4 to 5 in. long, 1 in. broad. Anthers slender, 15 in. long; filaments short, ciliate, decurrent in lines in the corolla-tube. Ovary short, rounded; style long, filiform; stigma clavate, apiculate. Follicles yellow, oblongfalcate, beak acute, base sessile; 3-keeled, the keels prominent; .75 to 1.25 in. long, .4 to .5 in. thick, 6- or more-seeded. Seeds ovoid or rhomboid, 3 to 4 in. long, surrounded by a reddish aril; testa crustaceous, grooved ventrally with a branching groove, furrowed longitudinally, the furrows intruded into the albumen; albumen copious; cotyledons cordate, rounded, 25 in. long; radicle stout, cylindric. Tabernæmontana malaccensis, Hook. f. in Fl. Br. Ind. III. 649.

PERAK: Scortechini 2024; King's Collector 1061, 4391. MALACCA: Griffith; Maingay (K.D.) 1061, 1062; Derry 87; Hervey. Selangor: Curtis 2353. Singapore: Hullett 521 (this specimen has very small leaves and rather larger more recurved follicles).

7. ERVATAMIA CURTISH, King & Gamble, n. sp. A shrub; branchlets slender, dichotomous, pale brown, striate when dry. Leaves membranous; lanceolate or oblong-lanceolate, caudate-acuminate at apex, attenuate at base; glabrous, green above, pale beneath; margins slightly recurved; 3 to 6 in. long, 1 to 1.5 in. broad; midrib slender, prominent beneath; main nerves 9 to 12 pairs, starting at an angle of about 70° with the midrib and at once curving upwards to and along the margin; secondary nerves and reticulations very indistinct; petiole 2 to 3 in. long, winged by the decurrent margins of the blade so as to be

practically sessile; the base half-stem-clasping and forming a stipular ridge at the node, with a ligule-like gland within. Cymes axillarv. usually to the second pair of leaves from the top of the branchlet: generally in pairs, about 6- to 10-flowered; peduncles slender, 5 to 1 in. long; pedicels very slender, about 5 to 6 in. long; buds slender. clavate, somewhat acute at tip. Calyx-tube almost none; lobes linearlanceolate, unequal, 1 to 15 in. long, with a large round gland at the base within, usually supporting 3 smaller linear ones. Corolla-tube slender. ·6 to ·7 in. long, slightly inflated at top opposite the stamens, glabrous within and without; lobes narrow, oblong, undulately crispate. 5 in. long. Anthers linear, acute or slightly mucronate, '08 in. long; filaments short, decurrent in lines within the tube. Ovary of two rounded carpels; style very slender; stigma clavate, bifid at tip. Follicles horizontally divaricate, ovoid, long-acuminately beaked, not keeled or recurved, bright orange in colour, 1 to 1.5 in. long, about 4 in. broad. Seeds about 6 to 8, obtusely angular, 25 to 35 in. in diameter, deeply hollowed ventrally, enveloped in a crimson aril; testa brown, glandular. furrowed, the furrows deeply indented in the copious waxy albumen: cotyledons cordate, 1 in. in diameter; radicle cylindric, 15 in. long.

PENANG: at the Waterfall. Curtis 1775. PERAK: at Kuala Wok,

Wray 852; Scortechini 63.

We have been somewhat in doubt whether Wray's and Scortechini's fruiting specimens really belong to the same plant as Curtis's excellent flowering ones, but after long consideration believe we are right in considering that they do.

8. ERVATAMIA POLYNEURA, King & Gamble. A slender glabrous shrub, reaching 20 feet in height; branchlets thick, very milky. dark brown, very prominently marked by the broad scars of fallen leaves. Leaves very coriaceous; elliptic or elliptic-ovate or ellipticoblong, obtuse or bluntly acute at apex, somewhat rounded at base; yellowish-brown when dry, upper surface green when fresh, wrinkled when dry, lower pale, dotted; margins recurved, slightly so in flower, strongly in fruit; 6 to 12 in. long, 2 to 3 in. broad; one of each pair usually smaller than the other; midrib very stout, prominently raised on the lower, depressed and keeled on the upper, surface; main nerves 20 to 35 pairs, parallel, starting at right angles to the midrib and only very slightly curving to meet in a looped intramarginal nerve, all very indistinct, as are the reticulations; petiole stout, 4 to 8 in. long, bordered by the decurrent margins of the blade, bases enlarged, furnished with axillary glands, and those of each pair joined by a stipular ridge. Cymes axillary, usually in pairs in the axils of the uppermost pair of leaves but one, dichotomous, 12- to 16-flowered, corymbose;

peduncles very stout, 1.5 to 2.5 in. long; pedicels thick, curved, about 3 to 6 in. long; in fruit the non-fruiting pedicels caducous, leaving broad prominent oblong scars; bracts small, entire, rounded; flowers scented; buds clavate, with large obtuse heads, 3 in. in diameter. Calux-tube short, thick; lobes ovate, obtuse, 1 to 15 in. long, with many small subulate glands in a row at the base within. Corolla-tube evlindric, 5 in. long, slightly dilated at two-fifths of the way up, funnel-shaped at the mouth, glabrous on both sides; lobes overlapping to the left, folded in bud, oblong, obtuse, up to 1 in. long. Stamens inserted at the dilatation; anthers linear, mucronate, :15 in. long; pollen-grains globose with small protruded round knobs. Ovary of two separate conical carpels; style short; stigma clavate, the apiculus bifid. Follicles orange, 1 to 1.5 in. long, 5 in. broad, falcate, dorsal edge straight, ventral edge much rounded, keels 3; beak long, usually hooked. Seeds about 4 to 6, ovoid or rhomboid, enveloped in a scarlet aril, deeply sulcate ventrally; testa crustaceous, glandular, ridged within; albumen copious. Tabernamontana polyneura, Scortechini MS, in Herb, Calc.

PERAK: at Bujoy Malacca, Scortechini 1867. MALACCA: Miller 9.

A very distinct plant, quite different in texture and appearance to any other herein described, but coming near to *Tabernæmontana dichotoma*, Roxb., of S. India and Ceylon. The description is largely after Scortechini.

Tribe III.—Echitideæ. Subtribe 1.—Parsonsiinæ. 15. Parsonsia, Br.

Twining shrubs. Leaves opposite. Flowers small, white, in terminal or axillary di-tri-chotomous cymes or thyrses. Calyx 5-partite, eglandular or 5-scaled or minutely many-glandular at the base within. Corolla tubular; tube short, cylindric or subglobose, naked at the throat; lobes 5, slightly twisted, overlapping to the right. Stamens inserted on the tube; filaments often twisted; anthers half-exsert, oblong-lanceolate or linear, acute, conniving round the stigma and adhering to it, the cells produced at the base into empty rigid appendages. Disk of 5 lobes or scales. Ovary 2-celled; ovules many in each cell; style filiform, dilated at the top, truncate; stigma columnar or elongate-conic. Fruit cylindric, of two follicular mericarps, long cohering but at length separating from the two placentas. Seeds linear or oblong, attenuate and comose at the apex; albumen scanty; cotyledons oblong-linear, flat; radicle superior.—Distrib. About 12 species, of Tropical Asia, Australia and New Zealand.

Filaments of the stamens twisted spirally around the style; corolla-lobes 2 in. long:—

Leaves more or less oblong, with 6 to 8 pairs of main nerves; corolla glabrous without; fruit 4 to 7 in. long

Leaves more or less ovate, with 10 to 12 pairs of main nerves; corolla pubescent without; fruit 2.5 to 3 in. long ...

corolla pubescent without; fruit 2.5 to 3 in. long

Filaments of the stamens not twisted spirally around the style:—
Corolla-tube cylindric-urceolate, lobes spreading, .075 in. long; disk deeply lobed; calyx-lobes with no or very small scales at base within; main nerves of leaves 6 to 8 pairs

Corolla-tube campanulate, lobes erect, .3 in. long; disk entire or undulate; calyx-lobes with a broad thin scale at base within; main nerves of leaves 8 to 10 pairs

...

1. P. spiralis.

2. P. Kunstleri.

3. P. stenocarpa.

.. 4. P. penangiana.

1. Parsonsia spiralis, Wall. Cat. 1631 (1828). An evergreen twining glabrous shrub; branchlets terete. Leaves subcoriaceous when green, membranous when dry; ovate-oblong or oblong-lanceolate, shortly somewhat abruptly and often obliquely acuminate at apex. acute or rounded at base; pale when dry, especially on the lower surface; 3 to 7 in. long, 1.5 to 3.5 in. broad; midrib rather broad, slightly raised beneath; main nerves 6 to 8 pairs, the lowest pair close to the base, starting at an angle of about 60° and arching upwards to anastomose near the margin; secondary nerves few, also the reticulations; petiole slender, 5 to 1 in. long, often twisted at base; stipular glands small, subulate, the bases of each pair connected by a stipular Cymes axillary, many-flowered, corymbose, 1.5 to 3 in. in diameter; peduncles variable in length, 1 to 4 in. long; secondary peduncles usually 3, 5 to 1 in. long; branches usually 3-chotomous; ultimate pedicels slender, about 25 in. long; bracts and bracteoles small, ovate; flowers greenish or yellowish with a red centre; buds clavate, with short tube and obtusely conical top. Calyx-tube short; lobes ovate, acute, ciliate, sparsely pubescent without, 1 in. long. furnished with an ovate-acute sometimes bifid scale at the base of each inside. Corolla-tube cylindric, 125 in. long, glabrous on both surfaces, villous at the throat; lobes 2 in. long, oblong, acute, erect or spreading. Disk-lobes triangular. Stamens inserted near the base of the tube; the filaments spirally twisted together, sparsely pubescent; anther-tails incurved at the base, anther-tips acuminate, hooked. Ovary ovoid, glabrous; style slender; stigma columnar with a bifid apex and short basal auricular ring. Fruit linear-lanceolate, acuminate, 4 to 7 in. long, ·75 in. broad, somewhat compressed, smooth, striate, glabrous. Seeds ·5 to ·75 in. long, slender, enlarged below, narrowed and cut away on one side above, and furnished with pale golden-brown coma, .75 to 1.5 in. long; cotyledons narrow, oblong, about 25 in. long; radicle ·1 in. long, slender. A. DC. Prodr. VIII. 402; Kurz For. Fl. II. 180; Hook. f. Fl. Br. Ind. III. 650; Trimen Fl. Ceyl. III. 134; Cooke Fl. Bomb. II. 135. P. oblonga, Wall. Cat. 1632; A. DC. l.c. P. pauciflora and P. acuminata, Wall. Cat. 1633, 1634. Helygia javanica, Blume Bijdr. 1043. Heligme javanica, A. DC. l. c. 425; Miq. Fl. Ind. Bat. II. 429. H. Rheedii, Wight Ic. t. 1303. Spirostemon spiralis, Griff. Notul. IV. 80, t. 411, fig. 1. Aganosma concanensis, Hook. Ic. Pl. t. 841. "Kudici Kodi," Rheede Hort. Mal. IX. t. 9, 10.

Kedah: on Lankawi Island, Curtis; at Coah, Curtis 450, 2109.

Penang: Wallich 1634; Curtis 1707. Perak: Wray 2244. Malacca: Maingay (K.D.) 1064. Singapore: Wallich 1633; Lobb; Kunstler 69.

—Distrib. India, Ceylon, Burma, Malay Archipelago, China.

2. Parsonsia Kunstleri, King & Gamble, n. sp. A slender climbing shrub; branchlets terete, pale to dark brown. Leaves membranous: ovate or ovate-lanceolate, acuminate at apex, rounded or acute at base; yellowish-green when fresh with reddish nerves beneath, dark brown and dull when dry, lower surface paler; sometimes slightly puberulous, especially on the nerves beneath; 3 to 6 in. long, 1.5 to 3 in. broad; midrib slender, raised above and sinuate when dry, raised beneath; main nerves 10 to 12 pairs, the lowest usually close to the margin, starting at an angle of 60° and curving upwards to and along the margin, raised on both surfaces when dry; secondary nerves few, chiefly between the upper main nerves; reticulations obliquely transverse, prominent on the lower surface; petiole slender, twisted, variable in length from 25 to 125 in. long, the base swollen, those of each pair joined by a nodal ridge with small acute stipular glands. Cymes axillary, corymbose, many-flowered, 2-chotomous, reaching 7 in. in length and about 3 in. in diam.; peduncles slender, curved, 3 to 5 in. long; secondary peduncles usually 3, 1.5 to 2 in. long; cymules about 10to 12-flowered; pedicels slender, 15 to 25 in. long; bracteoles ovate-acute, puberulous, 05 to 1 in. long; buds clavate, with short tube and conical head; flowers dark yellow without, reddish within. Calyx-tube short; lobes ovate, acute, ciliate, pubescent without, 1 in. long, furnished each with an ovate acute, sometimes emarginate scale at its base within. Corolla-tube cylindric below, 15 in. long, pubescent without, villous within at the mouth and between the filaments; lobes oblong, acute, ·2 in. long, pubescent without, glabrous within. Disk-lobes triangular, blunt; 025 in. long, glabrous. Stamens inserted near the base of the tube; the filaments twisted, sparsely villous; anther-tails incurved at the base, anther-tips blunt with a small membranous tip. Ovary ovoid, glabrous; style slender; stigma columnar with a conical sometimes bifid tip and basal spreading annular ring. Fruit linear-lanceolate,

acuminate, 2·5 to 3 in. long and ·2 to ·3 in. broad, glabrous, terete, slightly compressed, the mericarps at length separating. Seeds slender, ·4 to ·5 in. long, narrowly linear, constricted above and acuminate below, tipped with a 1 in. long coma of pale silky hairs; cotyledons narrow; radicle slender.

Perak: in low-lying localities, Kunstler (King's Collector) 1824, 5650.

3. PARSONSIA STENOCARPA, King & Gamble, n. sp. A slender twining shrub: branchlets terete, older somewhat channelled; innovations minutely rusty-pubescent. Leaves membranous; ovate-lanceolate shortly acute at apex, cuneate or sometimes slightly rounded at base; both surfaces sparsely but minutely pubescent when young, glabrous when old; margins recurved; 2 to 4 in. long, 1 to 2 in. broad; midrib slender; main nerves 6 to 8 pairs, slender, at about 50° with the midrib, the lowest pair less, curving upwards to anastomose near the margin, faint but apparent on the lower surface, as are the reticulations; petiole variable in length, 25 to 1 in. long, slender, often twisted near the base; stipular glands very small. Cymes axillary, few- (8to 10-) flowered, umbellate, pubescent; peduncles about 1 in. long; pedicels slender, 2 in long in flower, 3 in long and rather thick in fruit; bracteoles minute, subulate; flowers light yellow; buds short, oblongconical. Calyx-tube very short; lobes ovate-acuminate, 125 in. long; scales very small or none. Corolla-tube cylindric-urceolate, 15 in. long, densely pubescent within in the upper part; lobes ovate-acuminate, spreading, 075 in. long. Disk-lobes oblong, emarginate, 025 in. long. Stamens inserted near the base of the corolla-tube; filaments slender, radiating to the centre, but not spirally twisted; anthers hastate acuminate, the tails spreading outwards. Ovary ovoid-conical; style slender; stigma columnar with a bifid apiculus at tip and a ring at base. Fruit linear, terete, 5 to 7 in. long, 2 in. broad, rather quickly separating into two terete mericarps; placentas flat, very thin. Seeds 5 in. long, slender, slightly enlarged below, narrowed above and furnished with a coma of golden-silky hairs about 1 in. long; cotyledons oblong, 15 in. long; radicle slender, 1 in. long.

Perak: Scortechini 1292; Wray 3263; King's Collector 6062—in dense jungle, at 300 to 500 feet, clinging to trees.

- P. curvisepala, K. Schum., of New Guinea, is very near this indeed, and scarcely seems to differ, except in the greater hairiness, in the corolla-lobes being quite valvate (Lyonsia?), and in the calyx-lobes being much recurved.
- 4. Parsonsia penangiana, King & Gamble, n. sp. A climbing shrub; branchlets slender, dark brown, terete, internodes long. *Leaves* membranous; ovate, acuminate at apex, truncate or rounded at base;

both surfaces olivaceous brown, the lower the paler; margin slightly recurved; 5 to 7.5 in. long, 3 to 4 in. broad; midrib slender, prominent beneath; main nerves 8 to 10 pairs, the lowest pair close to the margin, those succeeding gradually further apart to above the middle, at an angle of 60° to 70° with the midrib, curving upwards to anastomose near the margin; secondary nerves none; reticulations transverse. distant, oblique; petiole 1 to 1.25 in. long, slender, bordered above by the decurrent margins of the blade. Cymes in axillary, corymbose. puberulous panicles; peduncle slender, 1.5 in. long, flattened; branches few, also flattened but shorter; bracteoles ovate, acute; pedicels 1 to ·2 in. long, slender; buds ovoid, acute; flowers yellowish-white. Caluxtube short; lobes triangular-ovate, 075 in. long, bluntly acuminate, ciliate, each with a broad short very thin scale nearly equalling the base within. Corolla-tube campanulate, not at all constricted. 3 in. long; lobes as long as tube, ovate-acute, the tip entire or notched, pubescent without, glabrous within, except the shaggy-villous ring at the insertion of the filaments. Stamens half-exsert, inserted a little below the top of the tube; filaments long, shaggy-villous, curved inwards to meet and then upwards but scarcely spiral; anthers long, sagittate, the spurs much incurved, the tip membranous-apiculate. Disk cylindrical, entire or slightly undulately lobed, '06 in. high, glabrous, fully enclosing the carpels. Carpels rounded, glabrous, at first connate, afterwards separating; style slender, conical above; stigma conical, with a spreading ring below and short often bifid tip. Fruit unknown.

PENANG: at the Waterfall, Curtis.

Curtis says this is a rare plant. It differs from the other species in the not constricted campanulate corolla-tube, the very broad scale at the base of the calyx within, and the entire cylindrical disk. When the fruit is known it may perhaps be found to require a new genus.

16. Vallaris, Burm.

Climbing or erect shrubs, or trees. Leaves opposite, minutely dotted. Flowers white, in axillary fascicles or in dichotomous pseudo-axillary cymes. Calyx 5-partite, glandular or not within; lobes narrow. Corolla hypocrateriform or subrotate; throat naked; tube short; lobes broad, contorted, overlapping to the right. Stamens inserted at the top of the tube of the corolla, partly exsert; filaments short; anthers sagittate, acuminate, conniving in a cone around and adherent to the stigma; the connective furnished with a large or small dorsal gland; cells with rigid basal spurs. Disk annular or cupular, with 5 lobes or scales. Ovary of 2 carpels, which are at first connate; ovules many in each carpel; style filiform; stigma thick, obscurely annular at base, often 2-lobed at the tip. Fruit oblong, acuminate, separating into 2

follicular mericarps. Seeds biseriate, ovate, acuminate or beaked, the apex furnished with a coma; albumen scanty or copious; cotyledons thin or fleshy, large; radicle cylindric, superior.—Distrib. Tropical Asia, in India and Malaya; species 5 or 6.

A climbing shrub; flowers in branching cymes; anthers with a large dorsal gland 1. V. Pergulana. Shrubs or trees; flowers in fascicles:—

Flowers large; leaves 3 to 4.5 in. long, .75 to 2 in. broad; anthers with a large dorsal gland 2. V. Maingayi. Flowers small; leaves 1 to 2 in. long, .5 to .75 in. broad; anthers with a small dorsal gland 3. V. lancifolia.

1. VALLARIS PERGULANA, Burm. Fl. Ind. 51 (1768). shrub, with an unpleasant odour; branchlets terete, pale brown. Leaves membranous: broadly elliptic or obovate, abruptly and shortly acute at apex, cuneate at base or sometimes rounded; both surfaces glabrous, the lower sometimes puberulous especially on the nerves: 4 to 7 in, long, 3 to 4 in, broad; midrib slender, impressed above; main nerves 7 to 9 pairs, at an angle of from 50° to 60° with the midrib. straight at first, curving and anastomosing near the margin, the upper ones meeting a looped nerve; secondary nerves very few; reticulations transverse, prominent; petiole .75 to 1.5 in. long, slender. Cymes lax. usually supra-axillary, puberulous, reaching 3 in. in length and 4 in. in breadth; peduncles short, under 5 in. long; branches dichotomous: pedicels slender, 25 to 5 in. long; buds obovate, acute; flowers white. Calux-tube very short, pubescent without; lobes lanceolate, acuminate. ·3 in. long, pubescent; glands very small, alternate with the lobes. Corollatube hypocrateriform; tube short, cylindric, 2 in. long, nearly glabrous: limb 35 in. long, cleft half-way down in ovate abruptly acuminate lobes. pubescent on both sides. Disk of 5 rounded villous lobes, incurved at tip. Stamens inserted near the top of the tube within; filaments thick. partly decurrent; anthers sagittate, short-apiculate, exserted. 2 in. long, the tails slender incurved, the dorsal surface with a large fleshy glabrous rounded gland at the forking of the cells. Ovary rounded, densely white-villous; style slender; stigma conical, with a rounded tip and bifid apiculus. Fruit not known. A. DC. Prodr. VIII. 399; Wight Ic. t. 429; Hook. Ic. Pl. t. 153 (V. Pergularia by error); Hook. f. Fl. Br. Ind. II. 651. V. ovalis, Miq. Fl. Ind. Bat. II. 427. Pergularia qlabra, Linn. Mant. 53. Emericia Pergularia, Roem. & Sch. Syst. IV. 401. Echites hircosa, Roxb. Fl. Ind. II. 18. "Flos Pergulanus," Rumph. Herb. Amb. V. 51, t. 29, fig. 2.

MALACCA: Griffith; Maingay (K.D.) 1063, cultivated. — DISTRIB. India (Bengal?), Ceylon, Malay Archipelago, Siam.

2. VALLARIS MAINGAYI, Hook f. in Fl. Br. Ind. III. 651 (1882). A large tree (Maingay), a tree 40 to 50 feet high (Curtis); branches stout, with black bark; branchlets closely ringed with transverse cracks. Leaves coriaceous; elliptic-lanceolate, obtusely acuminate at apex. acuminate at base; upper surface dark greenish-brown, lower pale, glabrous: 3 to 4.5 in. long, 75 to 2 in. broad; midrib slender, impressed above: main nerves 5 to 6 pairs, prominent beneath, curving unwards to and along the margin; secondary nerves and reticulations distinct beneath; petiole 2 to 4 in, long, black. Flowers fascicled, 4 to 12 together in one of the axils of each pair of leaves, on alternate sides: the base of the fascicle forming a short tubercle; pedicels variable in length. 2 to 5 in., slender or stout, slightly enlarged under the calyx; bracts or bracteoles none; buds about 5 in, long, tube and conical head of lobes about equal. Calux-tube short: lobes ovate, acute, ciliate, 06 in. long; glands alternate with the lobes, very small. Corolla-tube urceolate. 25 in. long, mouth constricted; lobes broad, ovate-oblong, folded in bud, 3 in. to 4 in. long, pubescent on the inner surface. Anthers halfexserted, apiculate, hairy on the ventral surface, a line of hairs near the tip on the dorsal surface; dorsal gland large. Disk annular, glabrous. with 5 rounded lobes, 05 in. high. Ovary conical, pubescent, of two combined carpels; style slender; stigma conical, ringed and hairy helow Fruit not known

Penang: at Batu Feringy and at Government Hill, 2,000 feet, Curtis 1767, 2748. Malacca: Maingay (K.D.) 1084. Singapore: Ridley 4917.

Haviland's 3050 from Kalong, Borneo, is clearly a species closely allied to this.

3. Vallaris lancifolia, Hook f. Fl. Br. Ind. III. 651 (1882). A rather stiff epiphytic shrub; branches stout, dark greyish-brown, somewhat angled, studded with many conspicuous corky wart-like lenticels; branchlets very slender, pale grey, twiggy. Leaves chartaceous; ovate, caudate-acuminate at apex, cuneate at base; glabrous on both surfaces; 1 to 2 in. long, 5 to 75 in. broad; midrib slender; main nerves very oblique; inconspicuous, parallel, 8 to 10 pairs, joined by an intramarginal slightly looped nerve; reticulations oblique, indistinct; petiole slender, 1 to 25 in. long. Cymes axillary, few-flowered, short (about 5 in. long); peduncles about 1 to 2 in. long, slender; pedicels very slender, 25 in. long; bracteoles minute, ovate-acute; flowers white. Calyx-lobes ovate, acute, ciliate, with 2 rounded fimbriate scales at the base of each; tube as long as lobes. Corolla hypocrateriform; tube cylindric, 15 in. long, narrowed upwards, pubescent within; lobes linear-oblong, 2 in. long, villous at the throat. Disk 5-lobed; lobes erose. Stamens

inserted near the top of the tube; filaments slender; anthers half-exsert, sagittate, the tip membranous, the spurs slender, rather short; dorsal gland narrow, inconspicuous. *Ovary* of 2 glabrous ovate carpels; style slender, with a cup-shaped top; stigma almost globose, with a short tip. *Fruit* not seen.

Penang: on Government Hill, 1,900 feet, Fox 33; Curtis 2146. Perak: at Goping, King's Collector 4273. Malacca: Maingay (K.D.) 1102.

17. Pottsia, Hook. & Arn.

Climbing shrub. Leaves opposite, with distant nerves. Flowers small, in lax large terminal and axillary trichotomous paniculate cymes. Calyx small, 5-partite, with a ring of small glands within at the base of each lobe. Corolla hypocrateriform; tube cylindric, constricted and naked at the throat; lobes 5, overlapping to the right, only slightly twisted, spreading. Stamens inserted at the mouth of the corolla-tube; filaments short; anthers exsert, sagittate, connivent in a cone round the stigma; cells with basal empty spurs. Disk annular, deeply 5-lobed. Ovary of 2 distinct carpels; style thickened in the middle, attenuate at base and under the ovoid-conical stigma; ovules many in each carpel. Fruit of two follicular mericarps, which are thin, terete, subtorulose. Seeds linear, elongate, not beaked, with a deciduous coma; albumen copious; cotyledons linear, flat; radicle superior.—Distrib. One species, Indian and Malayan.

Pottsia cantonensis, Hook. & Arn. Bot. Beech. Vov. 199, t. 43 (1836). A large climbing shrub; branches terete, cylindric; branchlets and innovations puberulous. Leaves membranous; ovate or ellipticovate, acuminate (usually abruptly and obtusely) at apex, rounded or subcordate at base; glabrous above, also beneath except for slight pubescence along the midrib; 2 to 4 in. long, 1 to 2:5 in. broad; midrib slender, much raised beneath; main nerves 5 to 6 pairs, distant, curved upwards to and along the margin; reticulations in a fine net-work; petiole slender, 75 to 1 in. long, minutely pubescent, the bases of each pair joined in a thin ridge at the nodes. Inflorescence 4 to 6 in. long, 6 to 10 in. broad at top; of trichotomous panicles ending in corymbose drooping cymes; primary peduncles 2 to 4 in. long, slender; secondary 1 to 2 in. long; rest slender, all rusty puberulous or glabrate; pedicels very slender, 5 in. long; basal bracts leafy; bracteoles minute, ovate, ciliate, caducous; buds slender, clavate; flowers pink. Calyx-tube very short; lobes ovate, each with 1 to 4 minute scales at the base inside. Corolla-tube cylindric-campanulate, slightly constricted at mouth, 15 to 2 in. long; lobes spreading, ovate, 15 in. long, 3-nerved, margins recurved. Anthers sagittate, smooth on the back with a very small gland near the apex, which is often hooked; basal cells slender, incurved; filaments pubescent, decurrent inside the corolla-tube in a white-pubescent ridge to a little way above the base. Disk-lobes linear-subulate, '1 in. long. Ovary-carpels short, oblong, pubescent at top; stigma obscurely ribbed. Follicles very slender, 1 foot long, flexuous, smooth, thinly coriaceous. Seeds black, very slender, glabrous, flat, 1 in. long, '075 in. broad, enlarged at the apex where they bear the coma; coma white, 1 to 1.5 in. long; albumen thin; cotyledons linear-oblong; radicle slender. Benth. Fl. Hongk. 222; Kurz For. Fl. II. 190, and Journ. As. Soc. Beng. XLVI. ii. 255; Miq. Fl. Ind. Bat. II. 450. P. ovata, A. DC. Prodr. VIII. 442. P. Hookeriana, Wight Ic. t. 1306 bis. Parsonsia ovata, Wall. Cat. 1630. Teysmannia laxiflora and Hookeriana, Miq. l. c. 455, 456; and Parapottsia, Addenda 1080. Vallaris laxiflora, Blume Bijdr. 1043. Euthodon paniculata, Griff. Notul. IV. 84; Ic. Pl. Asiat. t. 458, fig. 2.

Kedah: Ridley. Penang: Curtis 820. Perak: Wray 1904; Scortechini 1287, 1289; Curtis 3337; King's Collector 1318, 4657, 5532, 10292, 10988. Malacca: Griffith; Maingay (K.D.) 1095.—Distrib. India (E. Bengal and Assam), Burma, Java, S. China.

18. WRIGHTIA, Br.

Shrubs or small trees, with often slender branches. Leaves opposite, penniveined. Flowers red, white, or yellowish, in terminal or pseudo-axillary corymb-like cymes. Calyx short, 5-partite, with glands or scales inside; lobes obtuse. Corolla hypocrateriform; tube cylindric, usually short, usually slightly constricted at the throat; lobes 5, overlapping to the left; the throat or the lower part of the lobes usually (absent in W. religiosa) furnished with a corona of 5 to 10 scales, which are often lobed or fimbriate, and either distinct or connate in a ring. Stamens inserted on the mouth of the tube; filaments short, dilated; anthers exserted (almost included in W. dubia), sagittate, conniving around and adhering to the stigma; cells usually near the summit, base produced in solid spurs. Disk 0. Ovary of 2 free or connate, many-ovuled, carpels; style filiform; stigma ovoid, with usually a toothed basal ring. Fruit of 2 connate or distinct follicular mericarps. Seeds linear, attenuate at the apex, base with a deciduous coma; albumen scanty or 0; cotyledons broad, convolute; radicle short, superior.—DISTRIB. Tropical Asia and Australia; about 10 species.

Throat of corolla furnished with a corona of scales or fringes:—
Corona-scales 10, 5 alternate with lobes of corolla, free,
2-lobed; 5 opposite those lobes, adnate below, free above,

1. WRIGHTIA JAVANICA, A. DC. Prodr. VIII. 405 (1844). A small tree, reaching a height of 40 feet and a diameter of 12 to 14 in. (Curtis): branchlets slender, tomentose, as are the innovations and Leaves membranous; elliptic or elliptic-lanceolate. linear leaf-buds. abruptly and obtusely acuminate at apex, acute at base; upper surface minutely pubescent, glabrate when old; lower surface densely tomentose with ferruginous hairs; 3 to 5 in. long, 1 to 2.5 in. broad; midrib rather broad, scarcely raised; main nerves 10 to 12 pairs, nearly straight, reddish and sufficiently conspicuous beneath; reticulations obscure; petiole 25 in. long, densely tomentose. Cymes terminal, tomentose, 1 to 1.5 in. long and 2 to 3 in. broad, many- (about 15- to 20-) flowered; peduncle none, or about 25 in. long; branches 3-chotomous, about 4 in. long; pedicels slender, 2 to 3 in. long; bracteoles minute, subulate; buds clavate, the tube short, the head ovoid, inflated, often 5 to 6 in. long and 2 to 3 in. broad; flowers pale waxy-white with grevish centre. Calyx-lobes ovate, acute, glabrous within, 05 in. long; glands 2 to each lobe, elliptic, the two nearly covering the inside of the lobe. Corolla-tube short, 15 in. long, slightly constricted at mouth. glabrous within; lobes oblong, rounded, 5 in. long, at last spreading, puberulous on both surfaces. Scales 10; 5 alternate with corolla-lobes, free, inserted at base, 2 to 3 in. long, entire or bifid at apex, villous; 5 opposite the corolla-lobes, upper free part inserted nearly half-way up, very short and 2- to 3-lobed, villous, lower part adnate to the tube, glabrous or pubescent, twice as broad as the free ones. Anthers hard, stiff, pubescent, 25 in. long, apiculus penicillate; filaments very short, thick, sometimes furnished behind with 2 minute subulate glands. Fruit 10 to 12 in. long, rough, prominently beaked; follicles connate. Seeds very slender, about '6 in. long, excavate above; testa thin, striate; coma white, silky, 1.5 to 2 in. long; cotyledons broadly ovate, cordate, convolute, 25 in. long, with prominent nerves; radicle short, stout, ·075 to ·1 in. long. Miq. Fl. Ind. Bat. II. 432; Koord. & Val. Bijdr. I. 112. W. pubescens, Blume Bijdr. 1041 not of Br.

KEDAH: at 300 to 500 feet, King's Collector 1762, Tongka: Curtis

3054. Province Wellesley: at Tassek Glugor, *Curtis* 3738. — Distrib. Java (Koorders 13799, 13800, 13802, 14232).

In appearance this species would at first sight be taken for W. tomentosa, Roem. & Sch., but it is distinguished by the larger buds, shorter corolla-tube, and, above all, by the quite different corona-scales.

2. Wrightia Lævis, Hook. f. in Fl. Br. Ind. III. 654 (1882). A glabrous shrub or small tree, reaching 15 to 20 feet in height; branchlets slender, terete, very pale brownish-yellow. Leaves membranous; elliptic or elliptic-oblong, abruptly caudate-acuminate at apex, cuneate at base: shining above, dull and pale beneath, blueish when dry; 3 to 6 in. long, 1 to 3 in. broad; midrib slender, raised and usually nearly white beneath; main nerves 4 to 7 pairs, the lowest pair very near the margin, all arching upwards to and along the margin; secondary nerves and transverse reticulations pale, forming an elegant network especially conspicuous below; petiole very short, 1 to 2 in. long. Cymes corvmbose, 3-chotomous, pseudo-terminal, about 2 in. long and 2.5 in. broad; peduncles flattened, up to about 1 in. long; secondary peduncles also flattened, 25 to 3 in. long; pedicels slender, 5 to 75 in. long, often deflexed; bracteoles minute, ovate-lanceolate; flower-buds ovoid; flowers about 5 in. in diameter, blood-red (Maingay). Calyx-tube very short: lobes ovate, rounded, ciliolate, nerved, 06 in. long, each with 1 to 2 minute scales near the base. Corolla-tube very short, 05 in. long, glabrous; lobes oblong, minutely pubescent, 25 in. long; corona-scales fimbriate from the base, laciniæ glabrous, 2 in. long. Stamens exsert; filaments very short, thick; anthers sagittate, the connective villous on both sides; cells near the top only, very short. Ovary ovoid, glabrous; style slender, with an obconic top; stigma short, rounded. Follicles 7 to 8 in. long, connate, slender. Seeds very long (1.5 in.), slender, glabrous, striate.

POONGAH: Curtis 2943. PERAK: at 300 ft., Wray 3504; Scortechini 63, 77; King's Collector 8614. Malacca: on Mount Ophir, Maingay (K.D.) 1065. Selangor: Ridley 7566, at Ginting Bidai.—DISTRIB. Sumatra (Forbes 2605).

3. WRIGHTIA DUBIA, Spr. Syst. Veg. I. 638 (1825). A shrub, 2 to 8 feet high; branches stout, lenticellate; branchlets also thick, terete, pale brown, innovations minutely pubescent. Leaves chartaceous; oblong- or obovate-lanceolate, acuminate at apex, attenuate at base, sometimes almost rounded; dull on both surfaces, on the upper scaberulous, scarcely pubescent, dark, paler beneath; 3 to 6 in. long, 1 to 1.5, rarely to 2, in. broad; midrib slender, smooth, pale, prominently raised beneath; main nerves 8 to 12 pairs, the lowest very close to the margin,

the rest at irregular distances but rather oblique, arching unwards to and along the margin; secondary nerves few, reticulations distinct, all pale and easily seen on the lower surface; petiole extremely short. 0 to 2 in long. Cymes axillary and pseudo-terminal, few- (1- to 6-) flowered, secund; peduncles very short; pedicels pubescent. 25 in. long; bracteoles very small, pubescent, ovate-acute, sheathing the bases of the pedicels and at intervals along them; buds oblong-ovoid or fusiform, 1 to 1.5 in, long; flowers scarlet, orange without. Caluxtube short: lobes ovate-acute, ciliolate, otherwise glabrous, 125 in. long. 3 of them with two small, thin, rounded, membranous, lobed scales at base, the scales one-third to one-half the length of the lobes. Corolla hypocrateriform: tube campanulate, 25 to 35 in. long: lobes spreading, 4 to 5 in. long, linear-oblong or -acuminate, glabrous on both surfaces as in the tube; mouth with 5 small, ligulate, rounded. corona-scales alternate with the lobes and sometimes joined by a slightly thickened ridge. Stamens only slightly exsert; filaments very broad; anthers sagittate, produced in a short membranous tip, the basal spurs straight or incurved; connective faintly pubescent on the back. Ovary glabrous, conical; style thick, '1 in, long; stigma conical. with an annular ring. Follicles distinct, at first cohering at the apex. 8 to 12 in. long, 25 in, broad, acuminate, striate. Seeds linear, 75 in. long, pointed at both ends, the lower furnished with a long, deciduous. white, silky coma; testa thin, striate; albumen very thin; cotyledons convolute, cordate, 25 in. long; radicle cylindric, 15 in. long. Cameraria dubia, Sims Bot. Mag. t. 1646 (1814). Strophanthus Jackianus, Wall. Cat. 1643; A. DC. Prodr. VIII. 419; Miq. Fl. Ind. Bat. II. 442; Hook, f. Fl. Br. Ind. III. 655; Hook, Ic. Pl. t. 1521; Pax in Engl. Bot. Jahrb. XV. 380; Franchet in Nouv. Arch. Mus. Paris, 3, Sér. v. 260; Gilg in Engl. Monog. 12.

TRANG: in open jungle, on hilly ground at 200 to 300 ft., Kunstler 1400. Junkseylon (Tongka): Curtis. Penang: Jack; Wallich 1643; Curtis 188.

We consider that this species is rightly placed in this genus rather than in Strophanthus, on account of the structure of the seeds, but the stamens are much less exsert than is usual in Wrightin, and the corona-lobes are not cleft. There is in the Kew Herbarium an excellent drawing of a flowering and fruiting branch by Mrs. Hutton.

Curtis's No. 2915, from Junkseylon (Tongka), marked Strophanthus sp., an erect shrub 4 to 5 ft. high, with brick-red flowers, has exactly the flowers of Wrightia dubia, but the leaves are membranous, elliptic, short-acuminate at apex, cuneate at base, 7.5 in. long, and 2.75 in. broad. It cannot, however, be separated as a species, and may be called var. membranifolia, King & Gamble.

4. Wrightia religiosa, Benth. in Gen. Pl. II. 713 (1876). A small shrub or tree; branches stiff, grey; branchlets also stiff, twiggy, innovations scabrous-papillose. Leaves membranous, small; ovate-lanceolate, obtusely acuminate at apex, cuneate at base, those of young shoots linear-oblong; glabrous on the upper surface except for the crisped pubescence on the midrib, glabrous on the lower, the midrib only slightly pubescent; 5 to 1.5 in. long, 3 to 7 in broad, those of the shoots 2 to 2.5 in. long and .5 in. broad; midrib slender, crispedpubescent; main nerves about 4 pairs (shoot-leaves up to 10 pairs or more), curved upwards to join in a faint intramarginal nerve; secondary nerves and reticulations inconspicuous; petiole slender, scarcely 1 in. Cymes terminal, few- (up to 12-) flowered; main peduncles fairly stout, flattened, 2 in. long; secondary peduncles 1 to 4, about 1 in. long; pedicels capillary, 5 to 7 in. long, curved and twisted; bracteoles minute, ovate; buds ovate-oblong; flowers white. Calyx-lobes ovate, acute, ciliate, with a few (about 5) blackish scales near the top of the tube inside. Corolla-tube cylindric, glabrous, 15 in. long; lobes ovateorbicular, very thin, nervose, 25 to 3 in. long, glabrous; corona-scales Stamens long-exsert; filaments rather slender, 1 in. long; anthers linear-lanceolate, cells near the summit, connective thickened. Ovary ovoid, glabrous; style slender; stigma conical. straight, linear, terete, 3 to 6 in. long, divergent at an angle of about 20° to 40°. Seeds linear, 3 to 4 in. long, somewhat blunt at both ends, furnished below with a white silky coma 1 to 1.5 in. long; testa striate, faintly puberulous. Hook. f. Fl. Br. Ind. III. 653; Kurz For. Fl. II. 194. Echites religiosa, Teysm. & Binnend. Hort. Bogor. 126.

SIAMESE STATES: at Kasoom, Curtis 3241. MALACCA: Maingay (K.D.) 1071. SINGAPORE: T. Anderson 115; Maingay (K.D.) 3334; cultivated only.—Distrib. Siam (Schomburgk 132); Tenasserim.

Subtribe 2.—NERIINÆ.

19. Strophanthus, DC.

Small trees or shrubs; often climbing. Leaves opposite, penniveined. Flowers usually large, in terminal cymes. Calyx 5-partite, scales 5 to many within at the base of the lobes. Corolla funnel-shaped; tube short, campanulate or urceolate at the mouth and furnished with 10 free or connate corona-scales*; lobes 5, twisted, overlapping to the right, sometimes produced in long or short tails, rarely ovate-acute. Stamens inserted at the top of the tube, included; filaments short;

^{*} The corona-scales may be either considered as 10, free or connate; or as 5, often cleft to the base.

anthers sagittate, more or less acuminate or produced in a long bristle, connivent around the stigma and adhering to it; cells pollen-bearing near the top only, produced at the base in empty spurs. Disk none. Carpels 2, distinct; style slender; stigma thick, columnar or conical with a membranous reflexed frill at the base, tip simple or bifid; ovules many in each carpel, many-seriate. Fruit of two follicular mericarps, oblong or elongate, hard, divergent or divaricate. Seeds compressed, fusiform, narrowed into a long, feathery-plumose point, base with a deciduous coma; albumen scanty, fleshy; cotyledons oblong, planoconvex.—Distrib. Tropical and South Africa and Tropical Asia; about 40 species.

Lobes of the corolla exceeding the tube in length:-Lobes of the corolla more than 1 in. long; main nerves of leaves conspicuous; corona-scales falcate-acuminate:-Leaves 3 to 5 in. long; calyx-lobes acuminate from an 1. S. dichotomus. ovate base, .25 in. long; bracts short Leaves 1.5 to 3 in. long; calyx-lobes subulate-lanceolate, ·5 in. long; bracts long, similar to calyx-lobes 2. S. Wallichii. Lobes of the corolla scarcely .75 in. long, blunt at tip; main nerves very obscure; corona-scales a short crenate fold ... 3. S. perakensis. Lobes of the corolla almost as long as the tube; leaves 2 to 4 in. long; main nerves conspicuous; corona-scales linearfalcate; calvx-lobes ovate-acute, '1 in. long. .. 4. S. singaporianus.

1. STROPHANTHUS DICHOTOMUS, DC. in Bull. Soc. Philom. Paris III. 123 (1802). An erect or straggling sarmentose shrub, 9 to 10 ft. high; branches stout, as are the branchlets; bark of branchlets dark brown with prominent lenticels. Leaves chartaceous, often membranous when dry, elliptic, elliptic-oblong or -obovate, more or less abruptly shortly acuminate at apex, cuneate at base; both surfaces glabrous; margins recurved; 3 to 5 in. long, 2 to 3 in. broad; midrib prominent, impressed above, raised beneath; main nerves 8 to 9 pairs, impressed above, raised beneath, starting at an angle of about 70° with the midrib and slightly curved upwards to meet in a prominent intramarginal looped nerve at a little distance from the edge; secondary nerves few, between the main nerves; reticulations oblique, impressed above; petiole 25 in. long, articulate. Cymes dichotomous; peduncle short, stout, up to 5 in. long; branches short, corymbose, with ovate-acuminate, caducous bracts about 15 in. long; pedicels stout, 3 to 5 in. long; bracts small, ovate-acute; flowers whitish or greenish with dark purple corolla-tails. Calyx with very short tube; lobes glabrous, acuminate from an ovate base, 25 in. long, furnished within at the base with a pair of ovate-acute, entire or bifid scales. Corolla-tube slightly cylindric at first, then funnel-shaped, '75 in. long; lobes rounded at first, '5 in.

long, ending in very long, up to 4 in. or more, slender tails; coronascales alternate with the lobes, cleft nearly to the base, divisions linearfalcate on a broad base 2 to 25 in. long. Anthers pubescent on the back; tips produced in a very long, slender bristle; filaments broad. decurrent within the tube. Ovary glabrous; style stout, upper part rugose; stigma with a reflexed fringe. Follicles very large, divergent. about 8 in. long by 2 in. broad, broadest at the base where united, tapering to a broad rounded point. Seeds compressed, fusiform, 7 in. long, produced in a long beak, the upper part of which, about 1 in. long, is furnished with a brush-like coma of white silky hairs, 1 in, long or more; testa thin, dark brown; albumen very thin; cotyledons oblong, somewhat auricled at base, 4 in. long, 15 in. broad; radicle evlindrie, 25 in. long. A. DC. Prodr. VIII. 417; Bl. Bijdr. 1044; Mig. Fl. Ind. Bat. II. 441; Hook. f. Fl. Br. Ind. III. 655. S. Horsfieldianus, Mig. l.c. 442. S. scandens, Roem. & Sch. Syst. IV. 412. S. longicaudatus and S. Griffithii, Wight Ic. t. 1299, 1300; Mig. l.c. 442. S. caudatus, Kurz in Journ. As. Soc. Beng. XLVI. 257 and For. Fl. II. 191; Pax in Engl. Bot. Jahrb. XV. 263; Franchet in Nouv. Arch. Mus. Paris, 3° sér. V. 263; Gilg in Engl. Monog. 16. S. pentaphyllus, Griff. Notul. IV. 78. Echites caudata, Burm. Fl. Ind. 68, t. 26. Nerium caudatum, Lamk. Dict. III. 458.

Perak: Wray 1668, 3306; Scortechini 1819, 1740; King's Collector 3896, 8628. Malacca: Griffith; Maingay (K.D.) 1073; Lobb.—Distrib. Tenasserim, Java.

2. Strophanthus Wallichii, A. DC. Prodr. VIII. 418 (1844). A climbing glabrous shrub; branchlets slender, terete, bark brown with many prominent lenticels. Leaves membranous; elliptic-oblong or -obovate, abruptly and shortly acuminate at apex, cuneate to almost rounded at base, plicately folded when young; upper surface dull, dark, lower surface pale; margins undulate, recurved; 1.5 to 3 in. long, 75 to 1.25 in. broad; midrib prominent, flattened beneath, slightly impressed above; main nerves 7 to 8 pairs, at an angle of about 60° with the midrib, curving upwards to join in an intramarginal looped nerve well within the margin; secondary nerves and reticulations in an elegant network; all, with the main nerves and midrib, prominent on the under surface by their colour darker than that of the tissue; petiole slender, 25 in. long. Cymes dichotomous, spreading, reaching 3 in. long and 3 in. in breadth at the corymbose top; main peduncles 1 to 1.5 in. long; secondary peduncles about 4, up to 1 in. long; tertiary peduncles and pedicels slender, about 25 in. long; bracts or bracteoles at each joint in pairs similar to the calyx-lobes, linear-lanceolate, recurved, 25 to 35 in. long, minutely pubescent; flower-buds slender; flowers pink or yellow with

faint reddish stripes. Calyx-lobes subulate-lanceolate, 5 in. long, reflexed in flower, minutely pubescent; scales at base very minute, often Corolla-tube cylindric-funnel-shaped, as long as the calvxwanting. lobes; lobes ovate acuminate, produced into slender tails reaching 2 to 3 in. long; corona-scales cleft to the base, each half falcate acuminate, about 15 to 2 in. long. Anthers very narrow, produced in long slender soft awns up to 5 in long, the awns twisted together in the flower, connective on the back and lower part of awns minutely pubescent; filaments broad, decurrent half-way down the tube. Ovary glabrous, depressed; style slender, slightly pubescent. Fruit not known. Pax in Engl. Bot. Jahrb. XV. 378; Franchet in Nouv. Arch. Mus. Paris, 3e sér. V. 268; Gilg in Engl. Monog. 16; Hook. f. Fl. Br. Ind. III. 655; Mig. Fl. Ind. Bat. II. 442; Prain Beng. Plants 677. S. dichotomus, Wall. Cat. 1641; Wight Ic. t. 599; Lodd. Bot. Cab. t. 759; Grah. in Maund Bot. III. t. 150. S. caudatus, Kurz For. Fl. II. 193. Nerium caudatum. Roxb. Fl. Ind. II. 9; Burm. Fl. Ind. t. 26.

Junkseylon Island (Tongka): Curtis 2931. Trang: King's Collector 1387 or 1397 (?).—Distrib. India (Circars, Khasia Hills, Chittagong and Tenasserim).

3. STROPHANTHUS PERAKENSIS, Scortechini MS. in Herb. Calc. A slender climber; branchlets slender, glabrous, lenticellate. thinly coriaceous when green, membranous when dry, glabrous; ellipticoblong, acuminate at apex, acute at base; both surfaces somewhat pale, the lower paler; margins crispate, slightly recurved; 2 to 3.5 in. long, ·75 to 1 in. broad; midrib thick, impressed above, prominently raised beneath; main nerves very obscure, 10 to 12 pairs, leaving the midrib at an angle of about 70° and nearly straight, joining near the margin in a very faint intramarginal looped nerve; reticulations not visible; petiole ·25 in. long, channelled above and bordered by the decurrent margins of the blade. Cymes slender, few-flowered, about 1 in. long and 1 in. in diam., trichotomous; peduncle 25 to 5 in. long; secondary peduncles rather shorter, bearing 3 terminal flowers; pedicels slender, pubescent, about 'I in. long; bracts and bracteoles in pairs at all nodes, ovate and dark red at base, long acuminate, 15 to 2 in. long; buds slender, fusiform; flowers yellowish-green. Calyx-lobes ovate-lanceolate, acuminate, ·2 in. long, the three inner with two minute obtuse scales at the base within. Corolla-tube urceolate, constricted at the mouth, as long as the calyx-lobes; lobes ovate-cordate at base, long acuminate with a blunt tip, ·5 to ·7 in. long; corona-scales eleft to the base, scarcely more than a short crenate fold. Stamens included; filaments short, decurrent halfway to the base of the tube and ending in an obtuse spur; anthers sagittate, the connective produced in a soft pubescent tip as long as the

anthers, pubescent on the back. Ovary ovoid, glabrous; style thick, rough; stigma cylindric with a short fringe below and a point at the apex. Fruit not seen.

PERAK: at Dipong, Scortechini 1818.

4. STROPHANTHUS SINGAPORIANUS, Gilg in Engl. Monog. 11 (1903). A straggling shrub; branchlets slender, brown, thickly covered with white lenticels. Leaves elliptic or elliptic-oblong, abruptly and shortly acuminate at apex, acute at base; dull on the upper surface and dark brown when dry, paler on the lower; margins crispately undulate, recurved; 2 to 4 in. long, 1.5 to 2 in. broad; midrib stout, impressed above, prominently raised beneath; main nerves 6 to 8 pairs, starting at an angle of about 70° and curving upwards to meet in an intramarginal deeply looped nerve; secondary nerves and reticulations wellmarked beneath; petiole 25 to 4 in. long, bordered by the decurrent margins of the blade. Cymes dichotomous on a peduncle 25 to 1 in. long, reaching 2 in. in length and about 2 in. broad at the corymbose top; branch peduncles and pedicels rather stout, of varying length, pedicels greatly enlarged in fruit; bracts and bracteoles in pairs at all nodes, ovate-acute, about 15 in. long; buds clavate, flowers purple. Calyx-lobes ovate-acute, glabrous, 1 in. long, inner three furnished with 2 to 4 small glands at the base inside. Corolla-tube cylindric, sometimes a little constricted at the mouth, 25 in. long; lobes as long as tube, ovate-acute, campanulate; corona-scales linear-falcate, cleft to the base, ·1 in. long. Anthers produced in slender soft filiform awns; filaments pubescent, flattened, decurrent about half-way down the corolla-tube. Ovary ovoid, glabrous; style pubescent. Follicles 8 in. long by 5 to ·75 in. broad, base broad, middle slightly turgid, then tapering to a long hard curved point; divergent so as to lie in the same straight line; pericarp terete, smooth. Seeds oblong-lanceolate, 75 to 1 in. long, 1 in. broad, pointed above, produced below in a long feathery plumose point; the coma white, soft; testa pale-brown, puberulous. S. brevicaudatus, Wight Ic. t. 1302 (1850); Hook. f. Fl. Br. Ind. III. 656; Kurz For. Fl. III. 191 and Journ. As. Soc. Beng. XLVI. ii. 257; Pax in Engl. Bot. Jahrb. XV. 380; Franchet in Nouv. Arch. Mus. Paris, 3e sér. V. 259. Cercocoma singaporiana, Wall. Cat. 1623; G. Don Gen. Hist. Dichl. Pl. IV. 83; A. DC. Prodr. VIII. 432; Miq. Fl. Ind. Bat. II. 445.

Malacca: Griffith; Maingay (K.D.) 1072; Derry 528. SINGAPORE: Wallich 1623; Lobb; Kurz; Ridley 6040, 9149; King's Collector 1191.—Distrib. Mergui (?), Borneo (Haviland 1770, Beccari 797; Motley).

Subtribe 3.—Echitidinæ. 20. Urceola, Roxb.

Large climbing shrubs. Leaves opposite, penninerved. Flowers small, in dense corymbosely panicled cymes at the ends of the branchlets. Calyx 5-partite, without glands within; lobes oblong or linear. Corolla urceolate or subglobose; throat naked; lobes 5, short, valvate. subinduplicate. Stamens attached to the base of the corolla, included; filaments very short; anthers sagittate, scarcely acuminate, connivent around the stigma and adhering to it at their middle; cells produced at the base in empty spurs. Disk cupular or annular, truncate or shortly 5-lobed. Ovary of 2 distinct carpels, longer than the disk, many-ovuled; style short; stigma oblong-conic, subannulate at the base. Fruit of 2 spreading follicular mericarps, thick and acuminate or elongate, contracted or not between the seeds. Seeds oblong or linear, compressed, villous; tip contracted, bearded with long persistent brown hairs and crowned with a long white deciduous coma; albumen scanty; cotyledons flat, foliaceous; radicle short.—DISTRIB. Malay Peninsula and Archipelago; about 7 to 8 species.

Follicles straight, even, terete, slender, not constricted between the seeds:—

Follicles in one line or very slightly curved either way:-Leaves rusty-pubescent beneath; calyx-lobes linear, 1 to ·15 in. long, much recurved 1. U. elastica. Leaves nearly or quite glabrous beneath :-Leaves somewhat glaucous beneath; calyx-lobes broad obtuse, little recurved; corolla urceolate .. 2. U. Maingayi. Leaves reddish-brown beneath; calyx-lobes ovate, very small, under .05 in. long; corolla globose ... 3. U. brachysepala. Follicles recurved; leaves red-brown beneath when dry; calyxlobes longer than corolla 4. U. malaccensis. Follicles poniard-shaped, thickened in the lower part, longpointed above; calyx-lobes very short; leaves red-brown when dry .. 5. U. lucida. Follicles torulose, thickened opposite the seeds and constricted between them; leaves red-brown when dry 6. U. torulosa.

Species imperfectly known: 7. U. reticulata. 8. U. sp.

1. URCEOLA ELASTICA, Roxb. in As. Res. V. 167 (1799) with fig. (excl. fruit). A large climbing shrub; branches thick, with dark brown bark; branchlets slender, often flexuose, innovations pubescent. Leaves coriaceous, ovate or elliptic-ovate, abruptly acuminate at apex, rounded at base; upper surface glabrous except on the midrib and main nerves, lower rusty-pubescent, but reddish brown when dry; margin strongly

recurved, often with thicker pubescence beneath; 4 to 7 in. long, 2 to 3.5 in. broad; midrib stout, slightly impressed above; main nerves 10 to 12 pairs, strongly marked beneath, slightly impressed above, at an angle of about 60° with the midrib, straight at first and then curving and anastomosing near the margin; secondary nerves none; reticulations transverse. fairly regular; petiole 5 to 1 in. long, rusty-pubescent, twisted at the base, the bases of each pair joined by a ridge at the node. Inflorescence finely rusty-pubescent, trichotomous, up to 12 in. long and 8 in. broad: main branch peduncles 2 to 2.5 in. long; secondary branch peduncles 1 to 1.5 in. long; cymules terminal, corymbose or subumbellate. many- and densely-flowered, 05 to 1 in. long; bracts leaf-like; bracteoles linear-subulate, 1 to 25 in. long; flowers very small. Calux-tube short; lobes linear, 1 to 15 in. long, recurved. Corolla urceolate, tube 05 in. long, glabrous within, except a tuft of reflexed hairs between the stamens; lobes oblong, a little longer than the tube. acuminate, pollen-cells at the top; filaments broad, short, minutely pubescent. Ovary globose, pubescent; style short; stigma conical. Follicles connected at the base, straight, horizontal or sometimes recurved, cylindric, acuminate, brown-velvety-pubescent when young, smooth and glabrous when old, about 6 in. long and 3 in. broad. Seeds linear-oblong, 5 in. long, flattened, surmounted by a ring of tawny bristles, from the centre of which arises a coma of white silky hairs 1.5 to 2 in. long; testa slightly tawny-villous; albumen very scanty; cotyledons oblong; radicle rather long. A. DC. Prod. VIII. 358; Wight Ic. t. 473 (excl. figure and description of fruit); Miq. Fl. Ind. Bat. II. 416; Hook f. Fl. Br. Ind. III. 656. Tabernæmontana elastica, Spreng. Syst. Veg. i. 639. ? Vahea gummifera, Poir Dict. Suppl. V. 409.

Penang: Roxburgh (Howison and C. Campbell); Curtis 823; King's Collector 1749. Perak: Wray 595, 1812, 2308, 2599, 4273; King's Collector 2241, 2447, 3597, 4239, 4886, 5061, 7567, 10348. Selangor: Goodenough 10600. Malacca: Griffith; Maingay (K.D.) 1058, 1091; Cantley; Derry 404, 1024, 1031; Curtis 3477.—Distrib. Sumatra.

As noted by Hook, f. in Fl. Br. Ind., the fruit figured and described by Roxburgh, Wight, and A. DC. as that of *U. elastica* is that of *Orchipeda fatida*, Blume, a Javanese tree.

2. Urceola Maingayi, Hook f. in Fl. Br. Ind. III. 658 (1882). A large climbing shrub; branchlets nearly black, terete, more or less rusty-pubescent as are the innovations. *Leaves* coriaceous; elliptic, abruptly acuminate at apex, narrowed or rounded at base; glabrous and shining greenish brown on the upper surface, pale and dull and more or less glaucous on the lower, glabrous or minutely pubescent; margins recurved, 2.5 to 5.5 in. long, 1.5 to 3 in. broad; midrib prominent,

dark, impressed on the upper surface; main nerves 8 to 10 pairs, prominent, starting at an angle of about 70° with the midrib and curving upward to anastomose near the margin; secondary nerves few, reticulations transverse, prominent, more or less raised above; petiole 4 to 6 in, long. Inflorescence minutely rusty-pubescent, trichotomous, up to 8 in. long and 5 in. broad; main branch peduncles 2 to 2.5 in. long; secondary rather shorter: cymules terminal, corymbose or subumbellate: pedicels slender, 1 in. long; lower bracts leaf-like; bracteoles linearsubulate. 2 in. long; flowers very small. Calyx-tube very short; lobes ovate oblong, little recurved, obtuse at tip, 125 in. long. Corolla urceolate: tube very short, glabrous within; lobes oblong, rather longer than the tube. Anthers sagittate, obtuse at apex, the tails diverging. Ovaru globose, pubescent; style obconical; stigma conical with a short bifid apiculus. Follicles connected at the base, diverging nearly horizontally. 6 to 8 in. long, 25 in. broad, usually hooked at the tip; pericarp terete, dark brown, glabrous. Seeds linear-oblong, flattened, 6 in. long, surmounted by a ring of tawny bristles and a coma of white silky hairs 1 in. long; testa softly tawny-villous; albumen very scanty; cotyledons oblong; radicle rather long.

Perak: King's Collector 4743, 5134; Wray 2367 (young follicles curving inwards almost to a circle). Malacca: Hullett. Singapore: Maingay (K.D.) 1083; Ridley 2717.—Distrib. Borneo (Haviland 1527, 1767, 3497).

3. URCEOLA BRACHYSEPALA, Hook, f. in Fl. Br. Ind. III., 659 (1882). A climbing shrub; branchlets slender, dark brown, terete. chartaceous, perhaps coriaceous when green; elliptic, abruptly obtusely acuminate at apex, rounded at base; both surfaces smooth, red-brown when dry; margins slightly recurved; 4 to 5.5 in. long, 1.5 to 2.5 in. broad; midrib prominent, rather slender; main nerves 6 to 8 pairs, starting from the midrib at an angle of 70° to 75° and curved upwards to and along the margin only, the upper few meeting in an intramarginal nerve, rest anastomosing, all prominent, raised on the upper surface as are the prominent transverse reticulations; petiole slender, ·5 to 1 in. long, articulate near the base. Inflorescence puberulous, trichotomous, terminal on main or side branchlets, up to about 6 in. long and 5 in. broad; main peduncle 1 to 2 in. long, terete; secondary peduncle also about 1 to 2 in. long, flattened as are further branches; cymules corymbose, pedicels slender, often recurved: bracts leafy: bracteoles subulate, reddish, numerous; buds globose; flowers minute. Calyx-lobes very small, ovate, 03 to 04 in. long, very slightly puberulous. Corolla globose, villous without, glabrous within, except for tufts of hair between the stamens, inflated, 075 to 1 in. long; lobes induplicate. Anthers acute or very minutely apiculate; spurs slightly incurved. Ovary villous; style obconical; stigma conical, annulate at base. Follicles usually horizontal, in one line, sometimes slightly curved backwards, terete, 6 to 8 in. long, '2 in. broad, acuminate and slightly hooked at apex. Seeds flattened, '4 to '5 in. long, ending in a tuft of bristles and a milky-white coma about 1.5 in. long; testa tough, densely rusty-villous.

Penang: Curtis 403. Perak: Scortechini. Malacca: Maingay (K.D.) 1079, 1080; Curtis 3478; Goodenough 1564; Ridley 1610, 2727, 6937, 8397, 9125, 10772.

4. Urceola malaccensis, Hook. f. in Fl. Br. Ind. III. 658 (1882). A large climbing shrub, glabrous except the innovations and the inflorescence; branchlets nearly black, terete, rather slender. Leaves coriaceous ovate or ovate-oblong, obtusely caudate-acuminate at apex, rounded at base; upper surface pale green, pale when dry, lower red-brown when dry, both surfaces smooth; margins slightly recurved; 2 to 4.5 in. long, 1 to 2 in. broad; midrib strong, impressed above, raised beneath; main nerves 6 to 8 pairs, slender, prominently marked on both surfaces, starting at an angle of about 60° with the midrib and curved upwards to and along the margin, intramarginal nerve only near the tip; reticulations transverse, regular; petiole 5 to 75 in. long, slender, articulate near the base, the bases of each pair of leaves joined by a slender ridge at the node. Inflorescence of terminal or axillary cymes, hoary-pubescent, trichotomous, about 2 in. long and 3 in. broad; cymules many-flowered, congested, corymbose; peduncles about 1 to 1.25 in. long, flattened; secondary peduncles about 1 in. long, rest smaller; bracts leafy; bracteoles very many, linear-oblong, similar to the calyx-lobes; buds globose. Calyx-lobes linear-oblong or almost spatulate, unequal, recurved, up to 1 in. long. Corolla-tube very short; lobes oblong, induplicate, glabrous within except for a small tuft of hair between the stamens. Anthers obtuse, with a rounded apiculus; spurs straight. Ovary-carpels hirsute; style obconic; stigma conical, tip bifid. Follicles slender. terete, acuminate, 8 to 9 in. long, 2 in. broad, slightly curved, recurved so that the angle between them is about 240°. Seeds oblong-fusiform; acuminate at the base, the tip furnished with a ring of bristles enclosing the white, silky, about 2 in. long, coma; testa thin, villous, with goldensilky stiff hairs.

Perak: King's Collector 4464; Ridley 9666. Malacca: Maingay (K.D.) 1098, 1082, part. Selangor: Curtis 2395. Johore: Ridley 9158; G. King. Singapore: Hullett 846, 909; Cantley 121.

5. URCEOLA LUCIDA, Benth. in Gen. Pl. ii., 716 (1876). A climbing shrub, glabrous except the inflorescence; branchlets slender, nearly black, terete. Leaves chartaceous; elliptic or elliptic-oblong, abruptly

acuminate at apex with a usually oblique acumen, rounded at base; shining on both surfaces, red-brown when dry; margins slightly recurved; 3 to 5 in. long, 1.25 to 2 in. broad; midrib strong, very prominent beneath, slightly impressed above; main nerves 8 to 12 pairs, slightly impressed above, very strong beneath, starting at an angle of nearly 60° with the midrib and curved upwards to and along the margin, where they meet to form almost an intramarginal looped nerve; reticulations transverse, regular; petiole slender, 5 to 1 in. long, often twisted. Inflorescence of large terminal and axillary trichotomous panicles of cymes, reaching in all 1 ft. in length and breadth; peduncles and branches slender, uppermost only pubescent; main peduncles 2 to 3 in. long, secondary 1 to 1.5 in. long, tertiary about 5 in. long; cymules corymbose; pedicels short; bracteoles ovate acuminate, very small; buds globose or ovoid. Calyx-tube short; lobes broadly oblong, recurved, 05 in, long. Corolla urceolate, 1 in, long, tube very short; lobes oblong. longer than the tube, pubescent without, glabrous within. Anthers obtuse at the apex. Ovary glabrous or slightly hairy at the tip; style short; stigma conical. Follicles 3 to 4 in. long, horizontal, rigid (like poniards), base contracted, tip acuminate, 4 to 5 in. broad at the broadest a little above the base; exocarp thick; endocarp crustaceous: placenta woody. Seeds linear-oblong, 3 to 5 in. long, flattened, ending in a tuft of tawny bristles, which encloses a white silky spreading coma about 1 in. long; testa crustaceous, rusty-silky-pubescent; cotyledons foliaceous, 3 in. long; radicle 25 in. long. Hook. f. Fl. Br. Ind. III. 658. Chavannesia lucida, A. DC. Prod. VIII. 444. Echites? lucida, Wall. Cat. 1670; G. Don Gen Hist. Dichl. Pl. IV. 75.

Penang: Wallich 1670; Curtis 661, 941, 3569; King's Collector 1329. Perak: Scortechini 17, King's Collector 4929. Malacca: Derry 333, 978, 1158, 1169. Singapore: Hullett 860; Ridley 2745, 5628, 6937.

6. Urceola torulosa, Hook. f. in Fl. Br. Ind. III. 659 (1882). A climbing shrub, glabrous except the inflorescence; branchlets rather slender, very dark brown, terete. Leaves thinly coriaceous; ovate-oblong or oblong-lanceolate, acuminate at apex, acute or rounded at base, smooth on both surfaces, red-brown when dry; margin slightly recurved; variable in size, usually 4 to 7 in. long, 1.5 to 2 in. broad, but on end branchlets sometimes as small as 1 to 1.5 in. long and .75 to 1 in. broad; midrib slender, impressed above; main nerves very slender, 6 to 10 pairs, at about 50° to 60° with the midrib, curved upwards to and along the margin, where they anastomose; reticulations transverse, not prominent; petiole about .5 in. long, articulate near the base. Cymes terminal on side branchlets as well as on main branchlets, 2 to 2.5 in. long, 2 in. broad, pubescent; peduncles 1 to 2 in. long; branch peduncles short;

pedicels slender; bracteoles linear-subulate or lanceolate; buds globose; flowers very small. Calyx-lobes ovate-oblong, ·05 to ·075 in. long, obtuse, erect. Corolla urceolate; tube very short; lobes oblong acute, slightly longer than calyx-lobes, glabrous within except for tufts of hair between the anthers. Anthers ·075 in. long, tip acute or bifid, spurs short, straight. Ovary villous; style obconic, subannulate at the base; stigma conical. Follicles torulose, very slender, 1·5 to 2·5 ft. long, smooth, the swellings 1 to 1·5 in. apart; pericarp thin, smooth inside; placenta enlarged opposite the seeds. Seeds elliptic-lanceolate, ·5 in. long, the top crowned with a dense tuft of tawny bristles, within which arises the white silky coma 1 to 1·8 in. long; testa rather thick, ribbed, densely villous, with tawny hairs.

Malacca: Griffith; Maingay (K.D.) 1080, 1086; Derry 1096. Johore: Ridley 11132. Singapore: Ridley 152, 2722, 3602, 4433, 4960, 6523; ? Kunstler 198; Hullett 509.

DOUBTFUL SPECIES.

7. URCEOLA RETICULATA, King & Gamble, n. sp. A climbing shrub; branchlets nearly black, smooth, slightly angled; all parts glabrous except the inflorescence and extreme innovations. Leaves elliptic; abruptly caudate-acuminate at apex, rounded or slightly cordate at base, shining on the upper surface, often plicate; margin recurved; 3.5 to 6 in. long, 2 to 3 in. broad; midrib strong, prominent beneath, slightly impressed above; main nerves 10 to 12 pairs, impressed above, prominent beneath, at an angle of 70° with the midrib, at first straight, then curved to meet in a conspicuously looped intramarginal nerve; secondary nerves few, short; reticulations transverse, very prominent, especially beneath; petiole 5 to nearly 1 in. long, slender, articulate near the base. Inflorescence terminal or axillary, tawny-puberulous, trichotomous, very much 5- to 6-pinnately paniculate, reaching 12 in. in length and nearly the same in breadth, but in some cases and especially when axillary very much smaller; peduncles and their branches variable in length, but always long, slender, flattened; ultimate cymules, subumbellately corymbose; bracts leafy, gradually diminishing; bracteoles small, ovate-lanceolate to ovate; buds globose, minute. Calyx-tube short; lobes as long as tube, 03 in. long, ovate, acute. Corolla globose; tube scarcely any; lobes ovate 06 in. long, glabrous within except for the tufts of hair between the stamens. Anthers sagittate; tip flattened, membranous; spurs as long as the upper part; filaments very short. Ovary villous, style obconical; stigma conical, bilobed. Fruit not known.

MALACCA: Pun Bebas 122. SINGAPORE: Ridley 2745, 5628.

8. URCEOLA? branches and leaves glabrous; bark black when dry;

leaves 2 to 2.5 in. long by .75 to 1.25 in. broad, elliptic- or ovate-lanceolate, obtusely acuminate, narrowed into the petiole, firmly coriaceous; pale brown, shining above; nerves 3 to 4 pairs, very slender, ascending; follicles horizontal, 6 to 8 in. long by .25 in. broad, slightly curved, cylindric from the base, narrowed at the apex, hard; seeds .3 to .35 in. long, very slender, narrowed into a filiform process longer than the body, on which the fine pale brown hairs of the coma are placed. Hook f. Fl. Br. Ind. III. 659.

MALACCA: Maingay (K.D.) 1069.

We can do nothing to throw any further light on this remarkable plant. The structure of the seeds resembles that of those of *Kickxia*, but otherwise the plant is quite unlike that genus.

21. PARAMERIA, Benth.

Large climbing shrubs. Leaves opposite, rarely 3-nately whorled. Flowers small, in broad lax terminal or axillary panicles. Calyx small, 5-fid or 5-partite, with many glands at the base within. Corolla hypocrateriform or subcampanulate; tube short, broad at the mouth, naked; lobes 5, oblique, twisted, overlapping to the left. Stamens inserted at the base of the corolla, included; filaments short; anthers lanceolate-sagittate, acute or apiculate, conniving over and adhering to the stigma; cells spurred at the base. Disk of 5 connate scales. Ovary of 2 distinct carpels, longer than the disk, many-ovuled; style short, top obconical; stigma conical, with a minute nearly entire apiculus. Fruit of 2 long, slender, distantly torulose, follicular mericarps. Seeds linear or oblong, compressed, slightly or not contracted at the apex, crowned with short persistent bristles and a long deciduous coma; testa hairy; albumen scanty; cotyledons oblong, leafy; radicle short or long.—Distrib. India and Malaya, about 4 to 5 species.

Leaves under 6 in. long; inflorescence in loose paniculate cymes.

Leaves few- (5 to 7 pairs) nerved; inflorescence nearly glabrous; follicles 6 to 12 in. long; swellings opposite the seeds short; seeds under 5 in. long, pubescent . . . 1. P. glandulifera.

Leaves many- (8 to 10 pairs) nerved; inflorescence very tawny-pubescent; follicles 20 to 24 in. long; swellings opposite the seeds elongate; seeds 1 in. long, glabrous or slightly pubescent 2. P. polyneura.

Leaves over 6 in. long; inflorescence in dense.paniculate cymes; follicles 11 to 14 in. long; swellings opposite the seeds short; seeds 4 in. long, glabrous 3. P densiflora.

1. Parameria glandulifera, Benth. in Gen. Pl. II. 715 (1876). A large climbing shrub; branchlets stout or slender, brown, smooth. Leaves chartaceous, opposite or sometimes 3-nately whorled, elliptic, oblong or obovate, abruptly acuminate at apex, widely cuneate at base;

glabrous and shining on the upper surface, somewhat paler on the lower. glabrous except for tufts in the axils of the main nerves, not always found; margins slightly recurved; 3 to 5 in. long, 1.5 to 2 in. broad; midrib slender, impressed above, raised beneath; main nerves 5 to 7 pairs, arched upwards to and along the margin, where they anastomose, rather indistinct, as are the secondary nerves and reticulations; petiole short, 1 to 2 in. long, stout. Cyme-panicles terminal or axillary to the upper leaves, trichotomous, glabrous or slightly puberulous; branches spreading, slender; terminal cymules subumbellately corymbose; bracts leafy; bracteoles very small, ovate-acute; buds oblong, clavate; flowers white, fragrant. Calyx-lobes ovate, ciliate, puberulous outside, 05 in. long, with minute, inconspicuous, subulate glands at the base inside. Corolla campanulate; tube 125 in. long, puberulous without; lobes rather longer than the tube, rotate, twisted to the right, obtuse. Anthers very small, apiculate, the spurs long; filaments short, with a Ovary minutely hairy; style obconical. broad base. Follicles very slender, flexuous, 6 to 12 in. long, glabrous, acuminate, diverging at up to 60° and then curving to run parallel to each other; swellings from ·75 to 1·25 in. apart, short; pericarp thin, smooth; placenta enlarged opposite the seeds. Seeds oblong, concave on the ventral surface. 4 to ·5 in. long, ending in a tuft of brown bristles, and a silky coma about 1 in. long; testa pubescent, thin; albumen scanty; cotyledons ovate. ·15 in. long, very thin, foliaceous; radicle ·125 in. long, slender. cylindric. Kurz in Journ. As. Soc. Beng. XLVI. ii. 255 and For. Fl. II. 660; Hook, f. Fl. Br. Ind. III. 660. Ecdysanthera glandulifera, A. DC. Prodr. VIII. 443; Wight Ie. t. 1307 (E. Griffithii in text); Mig. Fl. Ind. Bat. II. 432. E. barbata, Miq. l.c. 431. Echites? glandulifera and monilifera, Wall. Cat. 1659, 1660; G. Don Gen. Hist. Dichl. Pl. IV. 75. Parsonsia barbata, Bl. Bijd. 1042.

Penang: Curtis 1142. Malacca: Griffith; Maingay (K.D.) 1077, 1093; Cantley; Derry 920, 943. Singapore: Wallich 1660; Lobb.—Distrib. Burma, Andaman Islands, Java, Borneo (Haviland 1993, 2056, &c.; Motley 776), Philippines, Cambodia.

2. Parameria polyneura, Hook. f. in Fl. Br. Ind. III. 660 (1882). A slender climbing shrub, glabrous except the inflorescence and innovations; branches stout, with dark-brown, rough, lenticellate, horizontally ridged bark; branchlets slender, minutely tawny puberulous. Leaves membranous; elliptic or elliptic-oblong or -obovate, abruptly short-acuminate at apex, narrowed and at length rounded at base; dark brown and shining above, paler beneath, and very red-brown and reticulate when dry, puncticulate; margins slightly recurved; 3 to 6 in. long, 1.25 to 2.5 in. broad; midrib prominent on the lower, impressed

on the upper surface: main nerves 8 to 10 pairs, the lowest pair very near the edge, starting at an angle of about 65° with the midrib. curving upwards to and along the margin, where they anastomose. raised beneath, as are the numerous secondary nerves and the prominent transverse reticulations; main nerves usually with a tuft of hair in their axils; petiole 1 to 2 in. long, articulate near the base. Inflorescence paniculate, terminal, sessile, trichotomous, 4- to 5-pinnate, tawny-puberulous, usually about 6 in. long and 6 to 8 in. broad; primary branches 1.5 to 2.5 in. long, flattened; subsequent branches gradually shorter; pedicels short, 1 in long, slender; cymules corymbose: bracts leafy; bracteoles very minute, ovate; buds shortly clavate; flowers white, with a pink throat. Calyx-tube short; lobes ovate. acute, ciliate, about 04 in. long; glandular scales minute, generally subulate. Corolla-tube campanulate, contracted at the base, 1 in. long. glabrous within, sparsely pubescent without; lobes ovate-oblique, twisted to the right, rotate in flower, as long as tube. Anthers very small, with a triangular membranous tip. Disk faintly 5-lobed. Ovary villous: style obconical; stigma conoidal. Follicles slender, straight, 20 to 24 in. long, glabrous, acuminate, diverging at 60° to 90° and then slightly curving to lie parallel; the swellings opposite the seeds elongate. 1 in. long and about 2 in. apart from centre to centre; pericarp thin, smooth; placenta enlarged opposite the seeds which embrace it. Seeds fusiform, 1 to 1.25 in. long, concave on the ventral surface, ending in a somewhat dilated cup-shaped tip, which bears a silky white coma up to 2 in. long; testa thin, minutely pubescent; albumen scanty; cotyledons oblong, 2 in. long; radicle cylindric, as long as cotyledons.

Penang: Curtis 1455, 3025. Perak: Wray 2308, 3459; Scortechini 58, 1838; King's Collector 3337, 3640, 5687, 7491. Malacca: Griffith; Maingay (K.D.) 1078; Hervey; Derry 1013, 1206; Goodenough 1241; Ridley 10790. Singapore: Ridley 2713, 2721; Cantley 140; Hullett 849.—Distrib. Tenasserim (Lobb); Borneo (Haviland 1598, 1796; Fraser 255); Sumatra (Forbes 2951).

3. Parameria densifiora, Oliv. in Hook. Ic. Pl. t. 1520 (1886). A shrub; branchlets stout, about '25 in. in diameter, fistular, densely rusty-tomentose. Leaves chartaceous; obovate, oblong or oblanceolate, abruptly acuminate at apex, cuneate and at last rounded at base, glabrous and shining on the upper surface, sparsely pilose on the lower surface, especially on the nerves; margins recurved; 5 to 8 in. long, 1.75 to 2.5 in. broad; midrib stout; main nerves 6 to 8 pairs, at an angle of about 30° with the midrib; at first nearly straight, then curving upwards to anastomose near the margin, impressed above; secondary nerves short; reticulations transverse, distant, not promi-

nent; petiole stout, channelled, about 2 in. long. Inflorescence terminal, or axillary to the upper leaves, rusty-pubescent, densely corymbosely paniculate, sessile, reaching 6 in. in length, and about 4 to 5 in. in breadth; main peduncles 1 to 1.5 in. long, flattened, stout; branches opposite or verticellate, also flattened, as are the minor and much shorter branches; pedicels slender, about 15 in. long; bracts leafy; bracteoles small, ovate, acute; buds broadly clavate. Calyx very small; lobes ovate, acute, pubescent without, glabrous within, 03 in. long; scales 3 to 5 to each lobe, obscure. Corolla funnel-shaped; tube rather slender, minutely pubescent without, 15 in. long; lobes ovateoblique, twisted to the right, glabrous. Anthers apiculate; filaments very short. Ovary almost glabrous; style short, obconic; stigma conical. Follicles slender, 11 to 14 in. long, nearly at right angles and curved inwards, distantly torulose, the spaces 1 to 1.25 in. long; the swellings ellipsoid, 5 in. long; interspaces less near the tip; pericarp brown, minutely rusty-puberulous at first, afterwards glabrescent. Seeds 10 to 12, 4 in. long, oblong, curved, obtuse at the tip, glabrous, dark reddish brown, the tip with a tuft of tawny bristles surrounding a white silky coma 1 in. long; integuments 2, the outer hard.

Penang: on Government Hill, Curtis 158; Hullett 159.

22. Ecdysanthera, Hook. & Arn.

Glabrous climbing shrubs. Leaves opposite, acuminate with distant main nerves. Flowers small, white or pink, in terminal or axillary lax trichotomous paniculate cymes. Calyx small, deeply 5-fid, with few or no glandular scales at the base within. Corolla suburceolate, the throat naked; lobes 5, very short, obtuse, overlapping to the right, hardly twisted. Stamens inserted at the base of the corolla-tube, included; filaments short; anthers sagittate, conniving over and adhering to the stigma; cells produced at the base in empty spurs. Disk annular. Ovary of 2 distinct carpels, longer than the disk; style short; stigma obpyriform; ovules many. Fruit of 2 divaricate, terete, acuminate follicular mericarps. Seeds few, oblong or linear, compressed, little contracted at the apex and crowned by a persistent ring of short hairs and a long deciduous coma; albumen scanty; cotyledons oblong or ovate, leafy; radicle short.—Distrib. India, Malaya and Southern China; about 4 or 5 species.

1. ECDYSANTHERA MICRANTHA, A. DC. Prodr. VIII. 442 (1844). A large climbing shrub; branches slender, pendulous, lenticellate; branchlets brown, terete, lenticellate; innovations sometimes puber-Leaves membranous; ovate-lanceolate to oblong-lanceolate, obtusely acuminate at apex, acute or cuneate at base; glabrous on both surfaces, often reddish-brown when dry; 2 to 7 in. long, 1 to 2 in. broad; midrib slender; main nerves 3 to 5 pairs, at about 45° with the midrib, curved upwards to and along the margin and prominently connected by the transverse reticulations, often with a small tuft of hairs in the axils beneath; petiole ·3 to ·5 in. long, somewhat twisted. Cymes puberulous, trichotomous, reaching about 5 in. in length and breadth; main peduncles stout, variable; branch peduncles spreading, 1 to 2 in. long; cymules corymbose, many-flowered; pedicels slender, short, about 1 in. long; bracts linear, caducous; bracteoles very small, ovate-acute; buds ovoid. Calyx very small; lobes ovate, acute, pubescent, ciliate. Corolla urceolate, glabrous, very small (05 in. long); lobes falcate, spreading. Anthers obtuse, sometimes with a small apiculus. Ovary puberulous, twice as long as the disk. Follicles 3 to 4 in. long, 75 in. broad near the base, horizontal, slightly recurved, narrowed from above the base to the point; exocarp fleshy, punctate; endocarp shining, crustaceous. Seeds elliptic-lanceolate, 75 in. long, 25 in. broad, compressed, narrowed above and bearing a ring of short tawny bristles and ending in a white silky coma 1.5 to 2.5 in. long; testa rusty-pubescent, thin; cotyledons oblong, leafy, about '3 in. long; radicle cylindric, about 15 in. long. Hook, f. Fl. Br. Ind. III. 662; Miq. Fl. Ind. Bat. II. 451. E. brachiata, A. DC. l.c. 443; Kurz in Journ. As. Soc. Beng. XLVI. ii. 255, and For. Fl. II. 189; Miq. l. c. 452. Echites? micrantha and brachiata, Wall. Cat. 1667, 1668; G. Don Gen. Hist. Dichl. Pl. IV. 75.

Perak: Scortechini.—Distrib. India (Sikkim, Assam, Khasia Hills and Cachar), Burma.

The only specimen available is rather a poor one, but we see no reason to doubt its identity. The description of the fruit and seeds is taken from Indian specimens.

2. Ecdysanthera multiflora, King & Gamble, n. sp. A large climbing shrub; branchlets pendulous, terete, prominently lenticellate; innovations slightly puberulous. Leaves membranous, ovate or ovatelanceolate, long acuminate often abruptly and obtusely at apex the acumen oblique, attenuate and almost rounded at base; glabrous on both surfaces; margins slightly recurved; 2 to 3 in. long, 1 to 1.5 in. broad; midrib slender, impressed above, raised beneath; main nerves 4 to 5 pairs, the lowest close to the margin, all at about 60° with the midrib and curving upwards to and along the margin and connected by

the parallel transverse reticulations, often with minute tufts of hair in the axils beneath; petiole '4 to '6 in. long, slender, articulate. Cymes lateral, trichotomous, rusty-puberulous. very many-flowered, reaching 6 in. or even more in length and breadth; main peduncles 1 to 2·5 in. long, slender; branches many, slender, gradually lessening; ultimate cymules corymbose; pedicels filiform, '1 to '2 in. long; bracts none or very caducous; bracteoles minute, ovate-acuminate; buds oblong. Calyx-lobes ovate acute, with minute glands at the base within, pubescent without. Corolla urceolate, '06 in. long; lobes short, very slightly twisted to the left. Anthers acuminate, basal spurs rather long. Fruit not seen.

PERAK: on Larút Peak at 2000 to 3000 ft., King's Collector 2294, 2401.

23. CHONEMORPHA, G. Don.

Stout woody climbing shrubs. Leaves opposite, broad, with arching pinnate nerves. Flowers large, white, in lax terminal and pseudoaxillary, bracteolate, paniculate cymes. Calyx tubular, 5-fid or -partite, with a ring of glands at the base inside. Corolla hypocrateriform; tube cylindric, but slightly expanded both at base and apex, without scales; lobes 5, broad, overlapping to the right, twisted sharply to the left. Stamens 5, included, inserted on the throat of the corolla; filaments very short, broad, villous; anthers sagittate, acuminate, connivent over and adhering to the stigma, their cells shortly spurred at the base. Disk thick, annular or cupular, entire or 5-lobed. Ovary of 2 distinct carpels; ovules many; style filiform, cleft at the base; stigma conoid or Fruit of 2 long, straight, woody, parallel, triquetrous follicular mericarps. Seeds ovoid or oblong, flat, produced in a beak, which is again surmounted by a long silky coma; albumen thin; cotyledons flat, thick, oblong; radicle short.—DISTRIB. India and Malaya; 2 to 3 species.

Chonemorpha Macrophylla, G. Don Gen. Hist. Dichl. Pl. IV. 76 (1838). A large climbing shrub with copious milky juice; branches stout, warty; branchlets stout, soft, fistular, pubescent, becoming glabrous in age. Leaves coriaceous; broadly elliptic to elliptic-obovate or suborbicular, blunt, notched or shortly abruptly acuminate at apex, rounded or cordate at base; both surfaces glabrous or glabrescent when old, the lower pubescent, hirsute or tomentose when young; margins slightly recurved; 6 to 10 in. long, 3.5 to 6 in. broad; midrib very stout, impressed above, prominently raised beneath; main nerves spreading, 8 to 10 or sometimes 12 pairs, at variable distances and irregular and often branched, prominently raised beneath; secondary nerves many,

joining the irregular transverse reticulations, all much raised beneath: petiole stout, 5 to 1.5 in. long. Panicles up to 10 in. long and 8 in. broad, pubescent; peduncles stout, 3 to 4 in. long; branches also stout. angled or flattened, more or less racemose; bracteoles ovate, acute. persistent; pedicels about 3 to 4 in. long, usually shorter than the calvees; buds clavate, the tip acute; flowers white. Calyx tubular. wider than the corolla-tube and less than half its length; the mouth with 5 short rounded or subacute teeth. Corolla 3 in. or more across: tube .75 to 1 in. long, villous within in 5 bands between the stamens: lobes spreading, obovate-cuneate. Anthers 5 in. long. Follicles 12 to 18 in. long, straight, boldly 3-angled, the tips incurved, 75 to 1 in. broad; pericarp woody. Seeds about 1 in. long, ovate below, narrowed half-way up into a beak and again expanded to receive the coma, which is softly white silky and 2.5 in. long; albumen very thin; cotyledons ovate-oblong, thick, 5 in. long; radicle cylindric, slender, 25 in. long. A. DC. Prodr. VIII. 430; Wight Ic. t. 432; Brandis For. Fl. 328; Kurz in Journ. As. Soc. Beng. XLVI. ii. 257, and For. Fl. II. 187; Miq. Fl. Ind. Bat. II. 444; Hook. f. Fl. Br. Ind. III. 661; Trimen Fl. Ceyl. III. 138; Cooke Bomb. Fl. II. 139; Prain Beng. Plants 678. C. mollis, Mig. l.c. Echites macrophylla, Roxb. Fl. Ind. II. 13; Wall. Cat. 1657. E. grandis, Wall. Cat. 1658; Dalz. & Gibs. Bomb. Fl. 147, "Beluttakaka-kodi," Rheede Hort. Mal. IX. tt. 5, 6.

Penang: Ridley 3441; Curtis 832. Perak: Wray 2183, 2685, 3661; Scortechini 921; King's Collector 3636, 6000, 7304, 10574. Malacca: Maingay (K.D.) 1074; Derry 543.—Distrib. India, Ceylon, Malay Archipelago.

24. RHYNCHODIA, Benth.

Large climbing shrubs. Leaves opposite, membranous, broad, penninerved. Flowers in lax, broad, axillary or subterminal, paniculate cymes. Calyx 5-partite or -fid; lobes about as long as tube; glandular scales many. Corolla hypocrateriform; tube enlarged opposite the stamens, contracted at the throat, villous; lobes large, twisted, obliquely obcuneate or obovate-falcate, twisted to the left, overlapping to the right. Stamens inserted on the middle of the tube; filaments broad, short; anthers sagittate, conniving round and adhering to the stigma; cells with narrow incurved spurs. Disk annular, 5-fid. Ovary of 2 distinct carpels, longer than the disk; style slender, with an ovate truncate top; stigma columnar. Fruit of 2 narrow parallel compressed follicular mericarps. Seeds ovate or oblong, compressed, produced in a slender beak which is crowned by a deciduous coma;

albumen none; cotyledons oblong; radicle short, superior.—DISTRIB. One species, from India to China.

RHYNCHODIA WALLICHII, Benth. in Gen. Pl. II. 720 (1876). A large climbing shrub; branches distantly tubercled; branchlets glaucescent. rough, lenticellate, the scars of fallen leaves prominent. Leaves membranous; elliptic-ovate or -oblong, cuspidately or caudately acuminate at apex, cuneate sometimes unequally at base or occasionally rounded or even cordate; glabrous and shining above, glabrous or puberulous beneath; 5 to 9 in. long, 2 to 4 in. broad; midrib slender, raised beneath; main nerves 7 to 10 pairs, starting at an angle of about 50° with the midrib and curving upwards to and along the margin, where they anastomose to form a looped intramarginal nerve, raised beneath as are the few secondary nerves and the rather prominent transverse reticulations; petiole .75 to 1 in. long, slender, grooved, with small auricle-like stipular glands at the base. Cymes lax, axillary or subterminal, di-tri-chotomous, puberulous, reaching 5 in. long and about 7 in. in breadth; peduncles 1 to 3 in. long, slender, angled, puberulous or glabrous; branches long, slender, ultimate cymules subumbellate; pedicels ·3 to ·5 in. long; bracts oblong-lanceolate, ciliate, caducous; bracteoles at the bases of the pedicels, ovate-lanceolate, scarious, 1 in. long; buds clavate with conical tip; flowers white tinged with pink. Calyx campanulate; tube 1 to 15 in. long, furnished with many broad bifid scales at the base within; lobes linear-oblong, ciliate, obtuse. as long as the tube, margins reflexed. Corolla-tube broadly inflated opposite the stamens, 5-angled, 25 in. long, villous within, the throat narrowed; lobes obovate-falcate, about 5 in. long, slightly villous on the inner face. Anthers :15 in. long; spurs very slender. Follicles 12 to 18 in. long, pendulous. Seeds ovate-oblong; body 5 in. long; beak very slender, as long as body, crowned by a white silky coma 1.5 in. long; testa leathery, keeled on one side; cotyledons fleshy, flattened, 3 in. long, 1 to 15 in. broad; radicle thick, cylindric. Hook. f. Fl. Br. Ind. III. 667. Rhyncospermum Wallichii and R. ellipticum, A. DC. Prodr. VIII. 431. Echites rhyncosperma, Wall. Pl. As. Rar. I. 43, t. 49; Cat. 1665. E. elliptica, Wall. Cat. 1666. E. verticalis, Herb. Ham. Cercocoma Wallichii, Miq. Fl. Ind. Bat. II. 445; Kurz in Journ, As. Soc. Beng. XLVI. ii. 255, and For. Fl. II. 187.

Kedah: on Langkawi Island, Curtis 3203. Perak: Scortechini 1774; King's Collector 5635, 8790.—Distrib. India (Sikkim Himalaya, Assam), Burma, Tonkin.

25. Anodendron, A. DC.

Large glabrous climbing shrubs. Leaves opposite, with distant

nerves. Flowers in axillary or terminal trichotomous leafy paniculate cymes. Calyx small, 5-partite, glandular or not within. Corolla hypocrateriform; the tube cylindric, little dilated opposite the stamens; the mouth contracted, without scales; lobes narrow, overlapping to the right, twisted to the left, conical and spirally striate in bud. Stamens inserted below the middle of the tube; filaments very short; anthers sagittate, connivent round and adhering to the stigma; the cells shortly spurred at the base. Disk annular or cupular, entire or undulate. Ovary of 2 distinct carpels sunk in the disk and attached to it by their backs at the base, many-ovuled; style very short; stigma thick, conical, bi-lobed. Fruit of 2 divaricate acuminate follicular mericarps. Seeds few, ovoid or oblong, compressed, beaked, tipped with a long coma which extends down the upper part of the beak more or less; albumen usually copious; cotyledons ovate, subcordate, flat; radicle superior.—Distrib. India and Malaya; about 7 species.

Flowers in many-branched, many-flowered, cymes, usually 6-in. long or more; buds under 25 in. long; leaves coriaceous, more than 4 in. long and 1.5 in. broad, with prominent nerves:—

Main nerves 8 to 10 pairs, about '75 to 1 in. apart; corollalobes nearly glabrous within and at the throat, '05 in long; follicles with thin pericarp; seeds oblong, beak 1 in. long, the coma decurrent on the upper half......

Flowers in branched, corymbose, terminal cymes reaching 3 in. in length; buds 4 to 5 in. long; leaves coriaceous, under 3.5 in. long and 1.75 in. broad, with nerves nearly at right angles to the midrib

Flowers in axillary, paniculate, branched cymes reaching 2.5 in. in length; buds 225 in. long; leaves coriaceous, oblong-lanceolate, reaching 3.5 to 5.5 in. long and 1 to 1.5 in. broad, with nerves at about 75° with the midrib

1. A. paniculatum.

2. A. Candolleanum.

3. A. pauciflorum.

4. A. Wrayi.

5. A. lanceolatum.

1. Anodendron paniculatum, A. DC. Prodr. VIII. 444 (1844). A very large climbing shrub with greyish-brown bark; branchlets stout, rather fleshy, dark brown, glabrous, terete. *Leaves* thinly coriaceous; ovate, elliptic or elliptic-oblong, shortly and abruptly acuminate at apex,

cuneate and rounded at base; both surfaces glabrous; margins slightly recurved; 4 to 8 in. long, 1.5 to 3 in. broad; midrib stout, impressed and keeled above, raised beneath; main nerves 12 to 15 pairs, parallel, 4 to ·6 in. apart along the midrib, starting at an angle of from 60° to 70° with the midrib and arching upwards to and along the margin where they anastomose; secondary nerves few, short, between the main nerves: reticulations transverse, conspicuous only in young leaves when dry: petiole 5 in. long, stout, slightly winged. Cymes axillary and terminal. repeatedly trichotomously branched, reaching about 10 in. in length and 6 in. in breadth, glabrous; peduncles slender, angled, 5 to 1 in. long; successive branchings similar but shorter; ultimate cymules 3-flowered; bracts similar to the leaves and gradually smaller; bracteoles ovate acute, in pairs at the bases of the upper cyme-branches and of the pedicels, which are about .05 to .1 in. long; buds conical, striated spirally by the twisted lobes of the corolla; flowers white or pale yellow. Calyxlobes ovate, rounded, ciliate, the margins somewhat scarious, 06 in. long; scales none or very minute. Corolla-tube cylindric, dilated opposite the stamens and then contracted at the throat, '06 in. long; lobes oblong falcate, villous within and at the throat, 1 to 125 in. long, twisted sharply to the left. Anthers sagittate, acuminate, 04 in. long; spurs short. Disk cupular, entire, undulate, nearly enclosing the adherent glabrous carpels. Style almost none; stigma conical with an annular base. Follicles hard, woody, divergent in one line, 3 to 6 in. long, 5 to .75 in. broad near the base and thence narrowed to the blunt tip. Seeds few, obovoid, flattened, 5 to 1 in. long; beak 25 in. long, slender, slightly broadened at the tip, and bearing a 2 in. long whitesilky spreading coma which extends a short way down the tip; testa dark brown, thin; albumen copious; cotyledons oblong, rounded, 4 in. long by 25 in. broad, prominently nerved; radicle cylindric, 15 to 2 in. long. Dalz. and Gibs. Bomb. Fl. 147; Kurz in Journ. As. Soc. Beng. XLVI. ii. 255, and For. Fl. II. 188; Wight Ic. t. 1309 (fruit and seeds only); Hook, f. Fl. Br. Ind. III. 668; Miq. Fl. Ind. Bat. II. 454; Trimen Fl. Ceyl. III. 141; Cooke Fl. Bomb. II. 141; Prain Beng. Plants 679. Echites paniculata, Roxb. Fl. Ind. II. 17; Wight Ic. t. 396. E. coriacea, Wall. Cat. 1586. E. manubriata and E. polyantha, Wall. Cat. 1663, 1664. "Kaka-kodi," Rheede Hort. Mal. IX. t. 8.

JUNKSEYLON (Tongka): at Puket, *Curtis* 2933. Penang: *Curtis* 1740.—Distrib. Western India, Ceylon, Eastern Bengal, Burma, Malay Archipelago, Philippines.

2. Anodendron Candolleanum, Wight Ic. t. 1309 (1850) (excluding fruit and seeds). A very large glabrous climbing shrub; branches stout, rather fleshy, somewhat angular, light brown; branch-

lets terete, darker. Leaves coriaceous; elliptic, abruptly cuspidate acuminate at apex, cuneate or rounded at base; pale beneath, glabrous on both surfaces, margin recurved; in old leaves slightly cartilaginous; 5 to 9 in. long, 2 to 5 in. broad; midrib stout, impressed and keeled on the upper, raised on the lower, surface; main nerves 8 to 10 pairs, the lowest near the margin, the rest parallel, yellowish, very stout and prominent, about .75 to 1 in. apart along the midrib in old leaves, raised above, starting at from 75° to 80° with the midrib and curving only near the margin and along it; secondary nerves few; reticulations transverse, not prominent, impressed when dry; petiole 1.5 to 2 in. long, stout, twisted, keeled above. Cymes terminal and axillary, repeatedly 3-chotomously branched, reaching about 9 in. in length and 4 to 5 in. in breadth; peduncles terete, 1 to 1.5 in. long; branch peduncles long, slender, somewhat flattened; ultimate cymules in corymbose clusters; pedicels ·1 to ·15 in. long; bracts leafy; bracteoles ovate, acute, scarious, very small, caducous, in pairs at the nodes and below the pedicels; buds conical, spirally striate; flowers reddish or reddishbrown. Calyx-lobes ovate, somewhat acute; the margins scarious, not ciliate, 05 in. long; scales 0. Corolla-tube cylindrical, scarcely dilated, ·05 in. long; lobes oblong falcate, glabrous except the slightly puberulous mouth, 05 in. long, twisted sharply to the left. Anthers sagittate, acute, '04 in. long; spur short. Disk cupular, entire, undulate, nearly enclosing the glabrous carpels. Style short, slender; stigma conical with an annular base. Follicles slender, straight, 6 to 7 in. long, 4 in. broad at the broadest one-third of the length up, long-acuminate, slightly turned backwards; pericarp chartaceous, smooth. Seeds oblong, flattened, the margins incurved, about 1 in. long, produced in a slender beak of the same length, the upper half of which is furnished with a white silky coma 2 to 2.5 in. long; testa thin, dark brown; albumen copious; cotyledons ovate, acute, .75 in. long, .25 in. broad, prominently nerved; radicle ·2 to ·25 in. long, cylindric, Hook. f. Fl. Br. Ind. III. 669; Miq. Fl. Ind. Bat. II. 455. A. rubescens, Teysm. & Binnend. Cat. Hort. Bogor.

Penang: West Hill, Curtis 2258. Perak: King's Collector 5558, 6516, 7900, 8702. Malacca: Capt. Wight; Maingay (K.D.) 1087.—Distrib. Borneo.

3. Anodendron pauciflorum, Hook f. Fl. Br. Ind. III. 669 (1882). A climbing shrub; branches smooth glabrous; branchlets terete, dark brown. Leaves chartaceous; oblong or oblong-lanceolate, obtusely acuminate at apex, cuneately attenuate at base; glabrous on both surfaces, greenish above and reddish-brown beneath when dry; margins thin, pale when dry or cartilaginous; 3 to 4 occasionally to 5 in. long.

1.25 to 1.5 in. broad; midrib slender; main nerves slender, 8 to 10 pairs, at an angle of about 60° with the midrib, slightly curved to and along the margin; reticulations indistinct; petiole stout, 2 to 3 in. long, winged by the decurrent edges of the blade. Cymes terminal and axillary, much shorter than the leaves (rarely .75 to 1 in. long), few-(3-to 15-) flowered; peduncles stout, usually 5 in. long; branches trichotomous, very short, corymbose; pedicels very short; bracts and bracteoles ovate, crowded, small; buds clavate, tip conical, acute and much striate by the twisted corolla-lobes; flowers white or yellowish. Calyx-lobes ovate, ciliate, 1 in. long; scales minute, between the lobes. Corolla-tube cylindric, dilated below opposite the stamens, gradually attenuate upwards to the narrow throat, 3 in. long; lobes linear-lanceolate, falcate, glabrous without, slightly pubescent within, much twisted to the left, as long as tube. Anthers sagittate, with a hyaline apex; filaments very short, broad. Disk cupular, glabrous, undulate. Stigma sessile, pyriform. Follicles straight, divaricate at about 100° to 120°, 4 to 5 in. long, ·6 to ·7 in. broad a little above the rounded base, then narrowed to the acuminate, slightly incurved tip; pericarp thick, smooth, dark green. Seeds oboyoid. 6 in. long by 3 in. broad, flat, slightly hooked below, narrowed above to a long slender beak of 1 to 1.25 in. long, the upper half of which is furnished with a spreading white-silky coma 3 to 3.5 in. long; testa thin, dark brown; albumen rather scanty; cotyledons ovate, 45 in. long by 2 to 25 in. broad, fleshy; radicle cylindric, 25 in. long.

Penang: Maingay (K.D.) 1101; Curtis 663, 1457, on Government Hill at 1000 to 2000 ft. Perak: Wray 2105, 2569; King's Collector, 5587, 5599.

4. Anodendron Wrayi, King & Gamble, n. sp. A climbing shrub; branches stout, fleshy, with fibrous inner bark and grey outer bark studded with minute lenticels. Leaves coriaceous; obovate or obovateoblong, rounded at apex, with a minute glandular apiculus, cuneate at base; both surfaces glabrous; margin cartilaginous, recurved; 2 to 3.5 in. long, 1 to 1.75 in. broad; midrib very stout, impressed above; main nerves 14 to 16 pairs, parallel, at an angle of 80° or more with the midrib, straight and only slightly curved near the margin, raised above; secondary nerves occasional; reticulations indistinct; petiole 1 to 2 in. long, stout, wrinkled. Cymes terminal, corymbose, 3-chotomous, reaching about 3 in. long and broad; peduncles about 6 in. long; branches as long; pedicels slender, 3 in. long; buds clavate, tips conical, striated by the twisted corolla-lobes; flowers greenish yellow. Calyx-lobes ovate, acute, 06 in. long, glabrous, with 3 to 4 rounded scales at the base of each. Corolla-tube cylindric, slightly constricted in the middle above the stamens, 25 in. long, glabrous without, densely pubescent within;

lobes ovate, '2 to '25 in. long, rounded, densely tomentose within, twisted to the left. Stamens inserted just above the base of the corolla-tube; filaments very short; anthers sagittate; spurs incurved, as long as the pollen-bearing cells. Disk cupular, glabrous, undulate. Ovary of 2 carpels adherent to the disk; style short, obconoid at top; stigma conoidal. Fruit not known.

PERAK: at Gunong Bubu, 5000 ft., Wray 3828, 3836.

5. Anodendron lanceolatum, King & Gamble, n. sp. A glabrous climbing shrub; branchlets stout, nearly black, longitudinally wrinkled when dry. Leaves coriaceous; oblong-lanceolate, tapering to a blunt acumination at apex, narrowly cuneate at base; both sufaces slightly shining, pale brown when dry; margins recurved, broadly crispate; 3.5 to 5.5 in. long, 1 to 1.5 in. broad; midrib stout, channelled above. prominent beneath; main nerves about 15 to 16 pairs, at about 75° with the midrib, straight to join an inconspicuous intramarginal nerve close to the edge; secondary nerves alternate with and similar to the main nerves, branched above; reticulations irregular; petiole 4 to 5 in. broad, channelled above, the edges connivent. Cymes axillary, paniculate, nearly half as long as the leaves, reaching 2.5 in. long and about 1.25 in. in diameter; peduncles 1 to 1.5 in. long, flattened, with sometimes a small branch at the base, the next joint of the rachis nearly .5 in. long; side branches short, cymules close; pedicels short, variable; bracteoles ovate, acuminate, small; buds slender, clavate with a conical tip, striated by the twisted corolla-lobes, 225 in. long; flowers pale buff (Wray). Calyx shortly campanulate, deeply lobed; lobes ovate, acute, ciliate, '06 in. long. Corolla-tube sub-cylindric, dilated below, somewhat constricted above, glabrous except at the base within, :15 in. long; lobes as long as tube, oblong-linear, much twisted. Stamens inserted near the base of the tube; anthers sagittate, 06 in. long, tip obtuse or emarginate; empty spurs slender. Disk cupular. Ovary of 2 carpels, conical; style almost none; stigma conical, acuminate. Fruit not known.

PERAK: at Tapa, Wray 1321.

26. CLEGHORNIA, Wight.

Glabrous climbing shrubs. Leaves opposite, membranous, acuminate, penninerved, the main nerves straight. Flowers small, in axillary or terminal panicled or corymbose cymes. Calyx small, 5-partite, with 5 didymous glands alternate with the lobes. Corolla hypocrateriform; lobes 5, overlapping to the right, twisted or not to the left. Stamens inserted below the middle of the corolla-tube, conniving over and adhering to the stigma; filaments short; anthers sagittate, the cells shortly spurred at the base. Disk of 5 scales, cleft at the apex.

Ovary of 2 carpels, sunk in the disk; style short, obconical; stigma conical, apiculate. Fruit of 2 long, acuminate, follicular mericarps. Seeds oblong, narrowed at the ends, tipped with a deciduous coma; albumen scanty; cotyledons linear, flat; radicle superior.—Distrib. Ceylon and Malaya; about 3 species.

Leaves elliptic or elliptic-oblong, over 1 in. broad; cymes paniculate; corolla-lobes linear-oblong, over 1 in. long .. 1. C. malaccensis. Leaves lanceolate; cymes corymbose; corolla-lobes rounded, under 05 in. long 2. C. gracilis.

1. Cleghornia malaccensis, King & Gamble. A slender climbing shrub; branchlets pale brown, terete, often curved in the internodes. Leaves membranous; elliptic or elliptic-oblong, abruptly obtusely caudate-acuminate at apex, attenuate to almost rounded at base; bright green above, blueish-green beneath, nearly white when dry; margin recurved; 2 to 4 in. long, 1 to 1.5 in. broad; midrib slender, channelled above, raised beneath; main nerves 12 to 14 pairs, slightly impressed above, raised beneath, at about 70° to 80° sometimes at right angles to the midrib, straight and meeting in an intramarginal looped nerve; secondary nerves many, one usually between each pair of main nerves; reticulations few, inconspicuous; petiole 5 to 1 in. long, twisted. Cymes terminal, rarely axillary, paniculate, reaching 4 in. in length and breadth; peduncles slender, 75 to 2 in. long, flattened; branches trichotomous. flattened, variable; ultimate cymules subumbellate; pedicels 1 to 2 in. long; bracteoles ovate-subulate, very small; buds oblong-clavate; flowers waxy, white with yellow inside. Calyx-lobes lanceolate, ciliate, ·075 in. long. Corolla tubular-campanulate, ·2 to ·25 in. long, glabrous except for a minute pubescence near the throat within; lobes as long as tube, linear-oblong; margins incurved, slightly twisted to the left, Stamens inserted a little above the base of the tube; filaments slender; anthers sagittate, pubescent on the back, bluntly apiculate; the basal spurs long. Disk of 5 slightly bifid scales. Ovary scarcely exsert from the disk; style slender; stigma oblong, conical above and often bifid at tip. Follicles divaricate at about a right angle, 2.5 to 5 in. long, 25 in. broad, slightly incurved, acuminate, glabrous. Seeds linear-oblong or fusiform, 4 to 5 in. long, ending in a flattish point covered with a rather short coma of silky hairs; testa thin, brown. Baissea malaccensis, Hook, f. in Fl. Br. Ind. III. 663.

Perak: Scortechini 40; Wray 3457; King's Collector 5900, 8798, 10799. Malacca: Maingay (K.D.) 1094.

2. CLEGHORNIA GRACILIS, King & Gamble, n. sp. A slender climbing shrub, the stem reaching 1 to 2 in. in diam.; branchlets very slender-

dark brown, often curved in the internodes. Leaves membranous; lanceolate, long but obtusely caudate-acuminate at apex, cuneate at base: bright green above, paler beneath; margins cartilaginous; 2 to 3 in. long, 5 to 7 in. broad; midrib slender; main nerves 12 to 16 pairs, at about 70° to 80° with the midrib, straight, meeting in an intramarginal looped nerve; secondary nerves frequent, usually one between each pair of main nerves; reticulations indistinct; petiole slender, 25 in. long. Cymes axillary and terminal, slender, corymbose, reaching 2 in. in length and breadth; peduncles very slender, 5 to 75 in. long; branches trichotomous, capillary; pedicels 2 in. long; bracteoles very minute, subulate: buds clayate; flowers light yellow. Calyx-lobes orbicular, ·04 in. in diam.; scales very small or none. Corolla urceolate, ·1 in. long; tube minutely white-puberulous within; lobes rounded, not twisted, 04 in. long. Disk faintly 5-lobed. Anthers blunt or slightly emarginate at the tip, with a slender hair-like apiculus. Fruit not seen.

PERAK: on Cawfield's hill, 4000 ft., Scortechini 384; at 3000 to 4000 ft., clinging to trees, King's Collector 6351; Wray 3209.

The following Bornean species may eventually be found in the Malay Peninsula:—

CLEGHORNIA BORNEENSIS, King & Gamble, n. sp. A climbing shrub; branchlets purplish-brown when dry, angled, smooth, glabrous. Leaves elliptic or ellipticobovate, abruptly cuspidate-acuminate at apex, rounded at base; both surfaces glabrous, the lower pale; 4 to 5 in. long, 2 to 2.5 in. broad; midrib slender, raised and sharp beneath; main nerves 10 to 12 pairs, parallel, starting at about 70° with the midrid and curving gently upwards to and along the margin; secondary nerves few, chiefly between the upper main nerves; reticulations slender, oblique, more or less parallel; both main nerves and reticulations raised on both surfaces; petiole 2 in. long, bordered above by the crispate decurrent margins of the blade. Flowers in axillary and pseudo-terminal, glabrous, corymbose cymes, reaching 6 in. long and 3 in. broad; peduncles slender, 5.1 to 2.5 in. long; primary branches 3-chotomous, rest 2-chotomous; pedicels slender, variable, about 1 to 2 in. long; bracteoles small, ovate, in pairs at the axils and usually 2 in the middle of each pedicel; buds linearoblong; flowers yellow. Calyx campanulate; lobes ovate-acute, thin, 1 in. long, with small scales alternate with them within at the base. Corolla-tube cylindric, very slightly dilated at the base, slightly funnel-shaped towards the naked mouth, ·3 in. long; lobes ovate, rounded, only very slightly twisted to the left, ·15 in. long; the tube and mouth slightly villous within. Stamens inserted at the very base of the tube; anthers sagittate, the spurs slender; filaments very short, thick. Disk 5-lobed, enclosing the glabrous nearly globose carpels; style thick, obconic; stigma conical, apiculate. Fruit not known.

Borneo: near Kuching, Haviland and Hose 2169.

27. ICHNOCARPUS, Br.

Climbing shrubs with opposite leaves. Flowers small, in lax, many-flowered, terminal and axillary, paniculate cymes. Calyx 5-fid, glandular or not within. Corolla hypocrateriform, the throat contracted or villous; lobes narrowed to an obtuse point, overlapping to the right, the upper half of each lobe deflexed in bud. Stamens inserted at or below the middle of the corolla-tube; filaments very short; anthers sagittate, conniving over and adhering to the stigma; cells spurred at the base. Disk free, 5-lobed. Ovary of 2 distinct carpels, exserted from the disk, hairy; ovules many; style short, top obconic; stigma columnar. Fruit of 2 slender, spreading or divaricate, follicular mericarps. Seeds oblong, narrowed at the tip, ending in a deciduous coma; albumen copious; cotyledons long, flat; radicle short, superior.—Distrib. India, Malaya, Australia; species 5 or 6.

Leaves usually elliptic, acute, under 1.5 in. broad; inflorescence narrowly paniculate, very rusty-tomentose, under 3 in. long; corolla-tube globose opposite the stamens, contracted above; disk lobes capitate 1. I. frutescens. Leaves usually ovate, obtuse or acute, over 1.5 in. broad; inflorescence rather broadly paniculate, 3 to 5 in. long; rachis glabrescent; corolla-tube campanulate opposite the stamens, not contracted above; disk-lobes not capitate 2. I. ovatifolius.

1. ICHNOCARPUS FRUTESCENS, Ait. Hort. Kew. ed. 2, II. 69 (1811). A much-branched and extensively climbing shrub; branchlets slender, tawny-pubescent; innovations fulvous-tomentose. Leaves very variable, chartaceous; elliptic elliptic-oblong or elliptic-lanceolate or lanceolate, acute or acuminate sometimes mucronate at apex, cuneate or slightly rounded-attenuate at base; glabrous on the upper surface, pale and softly red-tomentose or glabrescent beneath; 2 to 4.5 in. long, 75 to 1.5 in. broad; midrib slender, impressed above; main nerves 5 to 7 pairs, curved upwards to and along the margin; reticulations in a fine network, conspicuous in young leaves; petiole 1 to 3 in. long, reddish-tomentose. Cymes paniculate, 1 to 3 in. long, terminal and axillary, often forming an elongated leafy thyrsus at the ends of the branchlets, rusty-pubescent or -tomentose; peduncles short; branches trichotomous; pedicels stout or slender, 1 to 2 in. long, often 3 together; bracts leafy, caducous; bracteoles ovate, acute, very small; buds clavate, tip conical; flowers greenish- or yellowish- white. Calyx-lobes ovate-acute or lanceolate, 05 to 1 in. long; glands none. Corolla-tube 1 in. long, cylindric at base, dilated and nearly globose opposite the stamens and then again constricted; pubescent without where dilated, glabrous within; mouth with slightly thickened folds and villous; lobes '15 to '2 in.

long, linear-falcate, with a twisted sparsely hirsute tip, white-hirsute within. Stamens very small; anthers 05 in. long, with small spurs. Disk with 5 linear capitate lobes. Ovary of 2 villous carpels; style slender, 05 in. long; stigma globose, with a conical tip. Follicles very slender, cylindrical, 3 to 6 in. long, 1 to 15 in. broad, curved. rusty-pubescent at first, afterwards glabrous; pericarp thin. linear-cylindric, 4 to 75 in. long, very slender, deeply grooved, scarcely beaked, tipped with a scanty white coma 1 in. long; testa thin, dark brown; cotyledons linear, very thin, 3 to 4 in. long, very narrow: radicle barely 05 in. long. A. DC. Prodr. VIII. 315; Benth. Fl. Austral. IV. 315; Wight Ic. t. 430; Wall. Cat. 1674; Brandis For. Fl. 327; Dalz. & Gibs. Bomb. Fl. 147; Kurz in Journ. As. Soc. Beng. XLVI. ii. 256, and For. Fl. II. 186; Hook. f. Fl. Br. Ind. III. 669; Mig. Fl. Ind. Bat. II. 448 and Suppl. 556; Trimen Fl. Ceyl. III. 142; Cooke Fl. Bomb. II. 142; Prain Beng. Plants 680. I. radicans, Wall. Cat. 1676. I. dasycalyx, Mig. l.c. 449. Echites frutescens, Wall. Cat. 1674: Roxb. Fl. Ind. II. 12.

PERAK: Scortechini 2199; King's Collector 820, 7049, 10986.— DISTRIB. India, Ceylon, Burma, Sumatra, Java, Australia (Queensland).

2. ICHNOCARPUS OVATIFOLIUS, A. DC. Prodr. VIII. 435 (1844). A climbing shrub; branchlets blackish-brown, terete; innovations slightly rusty-pubescent. Leaves variable, chartaceous; orbicular ovate or elliptic, obtuse acute or cuspidate at apex, rounded or attenuate or cuneate at base; glabrous on the upper surface, glabrous and paler on the lower or the midrib, villous; margins slightly recurved; 3 to 6 in. long, 1.5 to 3 in. broad; midrib slender, impressed above; main nerves 5 to 6 pairs, curved upwards to and along the margin; secondary nerves few; reticulations elegantly netted, conspicuous on the under surface of young leaves, scarcely visible in old ones, impressed above as are the main nerves; petiole slender, usually pubescent, '4 to '6 in. long. Cymes paniculate, up to 5 in, long, terminal and axillary, often forming an elongated, broad, leafy thyrsus at the ends of the branchlets; the rachises rusty-pubescent or glabrescent; the cymules densely pubescent; peduncles variable; branches trichotomous; pedicels stout, 05 to 1 in. long; bracts leafy or at the uppermost nodes; bracteoles very many, broadly ovate-acute, at the bases of the pedicels; buds obovate, tip rounded; flowers white. Calyx campanulate; tube .05 in. long; lobes ovate-acute or -acuminate, 06 in. long; glands none. Corolla-tube ·1 in. long, pubescent, cylindric below, then dilated opposite the stamens; mouth not contracted, but thickened in a fold within; lobes ·15 in. long, linear-falcate, villous within, especially at the tips, much twisted. Stamens very small; anthers .04 in. long, with small spurs, tip

acute. Disk with 5 linear-subulate, not capitate, lobes. Ovary of 2 villous carpels; style slender, ·03 in. long; stigma globose, with a long conical tip. Follicles cylindric, divarieate, densely rusty-pubescent. Hook. f. Fl. Br. Ind. III. 670; Miq. Fl. Ind. Bat. II. 449. I. affinis, Herb. Ind. Or. Hook. f. & Th. I. latifolius, Herb. Ham. in Wall. Cat. 1652. Echites affinis, Roem. & Sch. Syst. IV. 393. Springia indica, Muell. & Van Heurek in Plant. Nov. Van Heurek 143.

Penang: Curtis 810, 3082. Province Wellesley; Ridley 9392. Perak: Scortechini; Kunstler 181; King's Collector 10531. Malacca: Griffith; Maingay (K.D.) 1075, 1103. Pahang: Ridley 2179. Selangor: Ridley.—Distrib. India (Sylhet and Khasia Hills), Sumatra, Borneo, Celebes, Timor, Philippines.

28. Aganosma, G. Don.

Stout evergreen climbing shrubs. Leaves opposite. Flowers in many-flowered, terminal or axillary, tomentose or puberulous cymes. large or medium-sized, often sweet-scented, usually white. Calyx 5-partite to the base or nearly so; lobes lanceolate, more or less glandbearing at the base within. Corolla hypocrateriform, lower part of the tube cylindric, upper campanulate or cylindric, broader than the lower, bearing villous longitudinal bands behind the anthers; lobes broad or narrow, overlapping to the right, twisted more or less to the left. Stamens inserted on the base of the upper part of the corolla-tube; filaments very short; anthers sagittate, conniving over and adherent to the stigma; the cells spurred at the base, upper half only pollen-bearing. Disk cupular or cylindric, 5-lobed. Ovary of 2 distinct carpels, included in or somewhat exsert from the disk, usually hirsute, manyovuled; style short, top urn-shaped; stigma columnar, conical at tip. Fruit of 2 terete, straight or curved, follicular mericarps. Seeds oblongobovate or linear-obovate, flattened, not beaked, tipped with a deciduous silky coma; testa thin; albumen scanty; cotyledons oblong; radicle short, superior.—DISTRIB. India and Malaya; about 6 species.

Calyx-glands many, opposite the lobes, which are '25 in. long; ovary half-exsert from the disk; corolla-lobes narrow, linear; leaves with a prominent intramarginal nerve ... 1. A. marginata. Calyx-glands under 5, alternate with the lobes, which are '75 to 1 in. long; ovary included in the disk; corolla-lobes broad, rhomboid; leaves without a prominent intramarginal nerve ... 2. A. calycina.

1. Aganosma marginata, G. Don Gen. Hist. Dichl. Pl. IV. 77 (1838). A stout scandent or subscandent shrub; branches stout, prominently dotted with raised warts; branchlets slender, brown, lenticellate; innovations glabrous or rusty-pubescent; nodes, both of branches and

branchlets, with prominent ridges. Leaves membranous; oblong-lanceolate or elliptic-oblong, acuminate at apex often abruptly, rounded at base; glabrous above, glabrous or pubescent beneath; 2 to 5 in. long. ·75 to 1·5 in. broad; midrib slender, channelled above, raised beneath: main nerves 12 to 16 pairs at an angle of about 60° with the midrib. slightly arching to meet in a prominent intramarginal looped nerve. the lowest 1 or 2 pairs occasionally free, raised beneath; secondary nerves also prominent, usually one between each pair of main nerves: reticulations netted; petiole 15 to 25 in. long, slender. Cymes terminal or more often axillary, di-tri-chotomous, puberulous, variable in size but reaching to about 4 in. in length and 3 in. in breadth; peduncles about 1 to 2 in. long; branches gradually shorter; ultimate cymules corymbose: pedicels 15 in. long; bracts caducous; bracteoles linearsubulate, 25 in. long; buds cylindrical, slender; flowers white. Calvxtube almost none; lobes lanceolate-acuminate, 25 in. long, glabrous or pubescent, nerved, with many small subulate glands at the base within. especially on the inner lobes. Corolla-tube cylindric above, enlarged at the base below the stamens and sometimes slightly constricted near the mouth, which is thickened, 25 in. long, glabrous except for 5 villous bands behind the anthers within; lobes narrow, linear, acute, 5 to .7 in. long. Stamens inserted a little above the base of the tube; anthers lanceolate-acuminate, 15 in. long; filaments very short. Ovary of 2 obtuse carpels, glabrous, half sunk in the disk; style slender. annulate at top; stigma conoidal. Follicles pendulous, slender. slightly divergent, 52 to 1.5 ft. long, 3 to 4 in. broad, glabrous, dark brown, speckled, at first joined at the tip. Seeds linear-oblong, 3 in. long, crowned with a silky coma 1.5 in. long; albumen very scanty. Wight Ic. t. 425; A. DC. Prodr. VIII. 433; Kurz in Journ. As. Soc. Beng. XLVI. ii. 256, and For. Fl. II. 186; Hook. f. Fl. Br. Ind. III. 663; Prain Beng. Plants 679. A. acuminata, G. Don l.c.; Wight Ic. t. 424: A. DC. l. c. 434; Miq. Fl. Ind. Bat. II. 447. A. macrocarpa, A. DC. l. c. 434; Miq. l. c. Echites marginata, Roxb. Fl. Ind. II. 15; Wall. Cat. 1661. E. acuminata, Roxb. l. c. E. macrocarpa, Wall. Cat. 1662. E. reticulata, Boj. Hort. Maur. 211. E. apoxys, Voigt Hort. Sub. Calc. 522. ? E. cristata, Roth. Nov. Pl. 135. ? Chonemorpha cristata, G. Don l. c. 76.

TRANG: Curtis 3393; King's Collector 1426. KEDAH: on Langkawi Island, Curtis 2792. Penang: Curtis 664. Perak: Scortechini 6, 7, 68; King's Collector 7321. Malacca: Griffith; Maingay (K.D.) 1076, 1000 to 1002. Pahang: Ridley in Trans. Linn. Soc., Ser. 2, III. 3219. Singapore: Murton 74.—Distrib. India (Sylhet and Chittagong), Burma, Java, Sumatra, Philippine Islands.

2. Aganosma calvcina, A. DC. Prodr. VIII. 432 (1844). An immense (Scortechini) climbing shrub; branchlets stout, as thick as a goosequill, ferruginous-puberulous; nodes faintly ringed. Leaves coriaceochartaceous; elliptic or elliptic-oblong or elliptic-ovate, shortly and abruptly acuminate at the rounded apex, attenuately rounded at base. glabrous on both sides except for a few sparse hairs beneath; margins recurved; 3.5 to 6 in. long, 1.5 to 3.5 in. broad: midrib stout, impressed above, raised beneath; main nerves 7 to 10 pairs, starting at an angle of about 80° to 85° with the midrib and curving upwards to and along the margin; secondary nerves few, inconspicuous; reticulations minutely netted, impressed and prominent beneath; petiole 5 in. long, articulate. Cymes terminal, sessile, dichotomous, rusty-puberulous, corymbosely flattened, reaching to 5 in. in length and 8 in breadth; main peduncles 1 to 3 in, long, somewhat flattened, stout; branches similar but shorter and thinner; pedicels 5 to 75 in. long; bracts leafy, ovate-acuminate, caducous; bracteoles lanceolate, similar to calvx-lobes; buds conical; flowers large, white, handsome. Calyx-lobes lanceolate acuminate, 75 to 1 in. long, fulvous-tomentose, the inner 3 broadly keeled on the back; scales minute, subulate, 3 to 5 at the base within and between the lobes. Corolla-tube cylindric, rather stout, lower part narrowed, upper part broad and then slightly narrowed upwards, 4 to 5 in. long, 5sulcate, pubescent without, ferruginous-villous within in bands behind the stamens; lobes rhomboid, broad, half glabrous, half tomentose, as long as tube, twisted to the left. Stamens inserted on the broadest part of the tube within; filaments very short, densely villous; anthers sagittate, very slender, 3 in. long; basal spurs somewhat rounded; connective pubescent. Disk glabrous, conical, 5-furrowed and -lobed, 15 in. long, enclosing the ovary. Ovary of 2 carpels, glabrous below, longvillous above; style slender, enlarged upwards and dilated into a villous lobed cup; stigma conical, elongate. Fruit not seen. Kurz in Journ. As. Soc. Beng. XLVI. ii. 256, and For. Fl. II. 186; Hook. f. Fl. Br. Ind. III. 664. A. Roxburghii, G. Don Ex. Wight Ic. t. 440. A. Wallichii, G. Don Gen. Hist. Dichl. Pl. IV. 77. Echites calycina, Wall. Cat. 1653. E. caryophyllata, Roxb. Fl. Ind. II. 11.

Perak: Scortechini 16, from Gunong Chabary; King's Collector 10808.—Distrib. Tayoy.

29. Trachelospermum, Lemaire.

Climbing shrubs. Leaves opposite, penninerved. Flowers white or purplish, in lax terminal or pseudo-axillary eymes. Calyx small, 5-partite, with 5 to 10 small scales or glands at the base within. Corolla hypocrateriform, the tube cylindric, dilated opposite the stamens, con-

stricted at the mouth and sometimes almost closed with the folds; lobes 5, oblique, twisted to the left, overlapping to the right. Stamens inserted above the middle of the tube, included or the apices shortly exsert; filaments very short, broad; anthers sagittate, shortly acuminate, connivent around the stigma and adhering to it; the cells produced below in sharp spurs. Disk annular, truncate or 5-lobed. Ovary of 2 carpels, longer than the disk; style filiform; stigma columnar, base shortly ringed, tip conical; ovules very numerous. Fruit of 2 elongate incurved follicular mericarps. Seeds linear, not beaked, crowned at the apex with a long dense coma; albumen copious; cotyledons linear, flat; radicle short, superior.—Distrib. India, Malaya and Eastern Asia as far as Japan; about 8 species.

TRACHELOSPERMUM CURTISH, King & Gamble, n. sp. A climbing shrub; branchlets terete, slender, uppermost with innovations and inflorescence tawny-villous; nodes with a prominent pubescent ridge. Leaves membranous; elliptic or elliptic-ovate, abruptly acuminate at apex, auriculately cordate at base; strigosely hispid on both surfaces especially on the nerves, finally glabrous; 3 to 5 in. long, 2 to 3 in. broad; midrib slender, impressed and keeled in old leaves; main nerves 8 to 10 pairs, the lowest pair small deflexed, the rest at about 50° to 60° with the midrib, curved upwards to meet in an inconspicuous looped intramarginal nerve, and joined by the prominent transverse reticulations; petiole 3 to 5 in. long, tawny-villous. Cymes terminal, sessile, corymbose, tawny-villous, up to 6 in. long and 8 in. in diam.; main branches 3 to 5; cymules congested; pedicels short, 1 to 2 in. long; bracts leafy, caducous; bracteoles linear-subulate, densely tawny-villous at the joints and the bases of the pedicels; buds clavate, apex conoidal; flowers white, very sweet-scented. Calyx-lobes linear-lanceolate, slightly villous without, 1 in. long, longer than the tube, with small subulate scales at the base between the lobes. Corolla-tube narrowed below. then dilated opposite the stamens, then gradually narrowed to the constricted mouth, 5 to 6 in. long in all, glabrous within; lobes obliquely triangular-spathulate, dentate at apex, 4 to 5 in. long, twisted to the left, glabrous. Stamens inserted at or a little below the middle of the tube; filaments stout, short, rugose, decurrent below; anthers sagittate, membranously apiculate; spurs as long as or longer than the pollenbearing cells, slender, incurved below. Disk annular, 5-lobed, fleshy; lobes slightly emarginate. Ovary of 2 carpels, villous above, rounded; style slender, gradually enlarged; stigma columnar, obscurely angled, with a short spreading ring below and conical point. Follicles 8 to 9 in. long, 25 in. broad, somewhat flattened, divergent at about right angles and curved inwards to an acute tip; pericarp scabrous-puberulous,

dark brown with a reddish tinge. Seeds oblong, 7 to 8 in. long, 2 in. broad, acute at base, slightly narrowed above and then broadening below the 1 to 1.5 in. long white-silky persistent coma; testa thin, dark brown; albumen moderate; cotyledons lanceolate, 5 to 6 in. long, 1 in. broad; radicle short.

Penang: at Balick Pulau, Curtis 838. Perak: King's Collector 5194.

We have been a good deal in doubt of the genus of this species; in the Kew Herbarium it was placed with Chonemorpha, but the comparatively small flowers and different seeds distinguish it from that genus; in some respects it comes most nearly to Epigynum, but on the whole we prefer to keep it where we first placed it in Trachelospermum, to which genus it seems to us to come most near, especially in the characters of the inflorescence and the fruit. There is in the Kew Herbarium a species (unnamed) which approaches very near to this. It has been sent from the Khasia Hills (Hook. f. and Th.); from Manipur (Watt 7272); and from Yunan (Henry 12136). When it comes to be described with full material, it is by no means unlikely that the two will be found to require a new genus.

30. EPIGYNUM, Wight.

Climbing shrubs. Leaves opposite, penninerved, the nerves arching. Flowers can escent-tomentose, in dense subcapitate corymbose or paniculate leafy cymes at the ends of the branches. Calyx small, 5-fid; the lobes narrow, eglandular or with few glands. Corolla hypocrateriform; the tube elongate, dilated opposite the stamens; the throat villous, without scales; lobes 5, twisted to the left or nearly erect, overlapping to the right. Stamens inserted below the middle of the tube, included; filaments short; anthers linear-sagittate, acuminate, connivent around the stigma and hardly adhering to it; cells spurred at the base. Disk fleshy, 5-lobed, lining the calvx-tube. Ovary of 2 distinct carpels, dorsally adnate to the disk and surmounted by it; style filiform; stigma cylindric, with annular base and conical tip; ovules many in each carpel. Fruit of two linear terete distinct follicular mericarps sometimes torulose. Seeds elongate, compressed, broad at the tip and crowned with a thick coma of silky hairs; testa very thin; albumen moderate or scanty; cotyledons oblong, narrow, foliaceous; radicle short, superior.—Distrib. Malay Peninsula and Archipelago; about 4 to 5 species.

Leaves not tufted in the nerve axils, sparsely strigose-hirsute beneath; flower-buds over 1 in. long; corolla-lobes squared at tip 4. E. Ridleyi.

1. Epigynum perakense, King & Gamble, n. sp. A large climbing shrub; branchlets slender, reddish-brown, terete, uppermost and innovations minutely puberulous; nodes ringed. Leaves membranous; elliptic or elliptic-oblong, acute or shortly acuminate at apex, acutecuneate rhomboid or almost rounded at base; glabrous on both surfaces except for tufts of hair in the axils of the main nerves beneath: margins slightly recurved; 2 to 4 in. long, 1.5 to 2.5 in. broad; midrib slender, pale, raised beneath: main nerves 6 to 7 pairs, prominently raised beneath and pale, at from 50° to 70° with the midrib, nearly straight, meeting in a widely looped intramarginal nerve; secondary nerves few; reticulations irregular, scanty, prominent; petiole 25 to 5 in. long, twisted, articulate. Cymes terminal or axillary, crowded. grey-tomentose, trichotomous, up to about 1.5 to 2 in. long and broad; peduncles none or short; branch peduncles short; pedicels about 15 in. long; bracts leafy, caducous; bracteoles many, usually 2 to 3 to each pedicel, ovate-acuminate, similar to the calvx-lobes; buds clavate, twisted, .5 to .75 in. long; flowers white. Calux small, lobes ovate-acuminate, 075 in. long, with minute scales at the base. Corolla-tube cylindric, dilated below opposite the stamens, 6 to 7 in. long, grey-tomentose without, slightly villous within; throat with tufts of hair between the lobes: lobes 25 in. long, oblong, crenulate, rounded, twisted to the left, glabrous within, glabrous on the upper, tomentose on the lower half without. Stamens inserted a little above the base of the tube; filaments short, slender; anthers sagittateacuminate with long spurs, 15 to 175 in. long. Disk annular, 5-lobed, glabrous. Ovary of 2 glabrous carpels attached by their backs to the disk and within it; style slender; stigma cylindric, with a spreading ring below and conical tip. Follicles 10 to 12 in. long, densely browntomentose when young, tawny-puberulous when old, divaricate at about a right angle, torulose, the swellings opposite the seeds nearly 25 in. in diam., between them about 1 in.; pericarp chartaceous, thin. Seeds slender, fusiform, 1 in. long, flattened, gradually broadening upwards to an oblique tip, and furnished with a 1 in. long white silky coma; testa thin, scabrous; cotyledons narrowly linear-oblong, 25 in. long; radicle very small, .05 in. long.

Perak: Wray 1802, 1946, 2365, 4267; Scortechini 1474; King's Collector 1971, 2324.

This species comes near to E. Griffithianum, Wt., but has rather different more acuminate leaves with pale nerves when dry, and larger flowers not so villous within.

2. Epigynum Maingayi, Hook. f. in Fl. Br. Ind. III, 666 (1882). A climbing shrub; branchlets slender with ferruginous tomentum. Leaves membranous; elliptic, acute both at apex and at base; glabrous or minutely puberulous on the upper, yellowish-brown-tomentose on the lower surface; margin slightly recurved; 3.5 to 4.5 in. long, 1.5 to 2.5 in. broad; midrib stout, prominently raised beneath; main nerves 6 to 7 pairs, at about 60° with the midrib, at first nearly straight, then slightly curving to join an intramarginal looped nerve; secondary nerves few, inconspicuous as are the rather distant reticulations; petiole 25 in. long, tawny-tomentose. Cymes terminal or axillary, trichotomous, tawny-tomentose, reaching about 3 in. in length and 2 in. in breadth; peduncles 1 to 1.5 in. long; main branch peduncles ·5 to ·75 in. long, cymules paniculate; pedicels ·2 to ·3 in. long, stout; bracts leafy, deciduous; bracteoles ovate-acuminate, 075 to 1 in. long, 3 to each pedicel; buds clavate, whitish-brown-tomentose, 5 to .75 in. long; flowers white. Calyx small; lobes ovate-acuminate, 1 in. long, each with about 3 subulate pubescent scales at the base within. Corolla-tube cylindric, tawny-tomentose, slightly dilated below opposite the stamens, gradually enlarged above, with 5 villous longitudinal lines within, 6 to ·7 in. long; throat with tufts of hair between the lobes; lobes oblong, crenulate, rounded, twisted to the left, glabrous within, glabrous on one half and tomentose on the other half without. Stamens inserted a little above the base of the tube; filaments slender; anthers very narrowly sagittate, long-acuminate above and with spurs as long below, ·175 in. long in all. Disk annular, faintly undulate on the margin, glabrous. Ovary of 2 glabrous carpels attached to the disk at their backs and within it; style slender; stigma slender, cylindric, 1 in. long, with a spreading ring below and conical point above. Follicles 6 to 8 in. long, 15 to 25 in. broad, slender, cylindric, flexuous, rustytomentose. Seeds fusiform, pubescent, compressed, 6 to 7 in. long, obliquely truncate at top and crowned with a coma of white silky hairs.

PERAK: in open bamboo forests, 400 to 600 ft., King's Collector 8734. Malacca: Maingay (K.D.) 1088. Selangor: at Kwala Lumpor, Ridley.

3. Epigynum Curtisii, King & Gamble, n. sp. A climbing shrub; branchlets slender, terete, uppermost and innovations puberulous. Leaves membranous; lanceolate, acuminate at apex, attenuate and finally rounded at base; glabrous above, glabrous beneath except along the midrib and for the large hairy tufts in the axils of the main nerves; margins slightly recurved; 3.5 to 4.5 in. long, 1 to 1.5 in. broad; midrib slender, raised beneath; main nerves 7 to 8 pairs. at an angle of 60°

with the midrib, curving upwards and branching to form an obscure intramarginal looped nerve; secondary nerves not conspicuous; reticulations irregular, prominent beneath; petiole 25 in. long. Cymes terminal and axillary, pubescent, paniculate, few- (20- to 25-) flowered, reaching 3 to 3.5 in. long and about 1.5 in. broad; peduncles none or short, as are the branches; pedicels 15 to 2 in. long; bracts leafy, persistent; bracteoles ovate-acute, small, 1 to 2 at the base of each pedicel; buds elongate-clavate, 5 to 75 in. long; flowers white. Calyxtube 05 in. long; lobes ovate-acuminate, reflexed, with 1 or 2 small scales at base within. Corolla-tube cylindric, slightly dilated below opposite the stamens, greyish-tawny-tomentose without and with pubescent lines within, 6 in. long; throat with a villous ring; lobes oboyate, 3 in. long, twisted slightly to left in flower, more so in bud, glabrous within, glabrous without on upper, pubescent on lower half which is exposed in bud. Stamens inserted a little above the base of the tube; filaments slender; anthers narrowly sagittate, long-acuminate, ·175 in. long; spurs long and slender. Disk annular, shortly lobed. Ovary of 2 glabrous carpels attached by their backs to the disk and within it; style slender; stigma conical, '075 in. long, with a spreading ring below. Fruit not seen.

Penang: on the road to Penara Bukit, at 2000 ft., Curtis 2441.

4. EPIGYNUM RIDLEYI, King & Gamble, n. sp. A slender climber; branchlets brown, terete, uppermost parts tawny-pubescent, nodes slightly raised. Leaves chartaceous; lanceolate or elliptic-lanceolate, acuminate at apex, attenuate at base; glabrous on the upper surface, sparsely strigosely-hirsute on the lower, especially on the nerves; margin slightly recurved; 2 to 4 in. long, 1 to 1.5 in. broad; midrib slender but prominent; main nerves 8 to 10 pairs, at an angle of about 60° with the midrib, nearly straight to meet a looped intramarginal nerve; secondary nerves irregular; reticulations few, transverse; petiole slender, ·25 to ·5 in. long, pubescent, channelled above. Cymes terminal, denselv rusty-villous; the branches sessile or pedunculate, few-flowered (7 to 8), trichotomous; bracts leafy, the lowest similar to the leaves, the succeeding ones smaller by degrees; bracteoles minute, ovate-acute, on the short (2 to 3 in. long) pedicels; buds very slender with narrowly conical tips, 1.5 to 1.75 in. long, densely pubescent; flowers white. Calyx-tube short; lobes ovate, acuminate, villous without, glabrous within, 15 in. long; scales none or very minute. Corolla-tube very slender, enlarged below opposite the stamens, gradually widening above, 1 to 1.5 in. long; rusty-villous without, also in vertical lines within, otherwise glabrous; lobes rhomboid, crenate, glabrous except the lower part outside which is exposed in bud, 25 to 3 in. long, twisted slightly to the left. Stamens inserted a little above the base of the tube; filaments $\cdot 15$ in. long, flattened, puberulous; anthers sagittate, $\cdot 25$ in. long, with a membranous tip and long basal spurs. $Disk\ 5$ -lobed; lobes sparsely long hirsute. Ovary of 2 glabrous carpels within the disk; style slender; stigma long cylindric, with a spreading fimbriate ring below and conical tip. Fruit not known.

PERAK: at Rawang, Ridley 7567.

The following species is here described as likely to be eventually found in the Peninsula:—

EPIGYNUM FORBESII, King & Gamble, n. sp. A climbing shrub; branchlets slender, terete, uppermost minutely puberulous. Leaves chartaceous; elliptic or elliptic-oblong, acute or shortly acuminate at apex, cuneate at base; glabrous or with scattered hairs above, glabrous beneath; 3.5 to 5.5 in. long, 1 to 2.5 in. broad: midrib slender, prominent beneath; main nerves 8 to 10 pairs, arching upwards to and along the margin and meeting in an intramarginal looped nerve, raised beneath; secondary nerves many; reticulations distant, irregular; petiole 2 to 4 in. long, twisted. Cymes terminal and axillary, about 20-flowered, congested, tawny-tomentose, sessile or very shortly peduncled; bracts leafy; bracteoles small, ovate-acuminate, 2 to 3 at the bases of the 1 in. long pedicels; buds clavate with large conical heads; flowers white. Calyx-lobes ovate-acuminate, 1 to 15 in. long, eglandular. Corolla-tube slender, cylindric, dilated below opposite the stamens, often twisted, 1 in. long; lobes spathulate, erenulate, glabrous except the part exposed in the bud, twisted to the left, 6 in. long. Stamens inserted a little above the base; filaments short, slender; anthers narrowly sagittate, acuminate. Disk glabrous, 5-lobed. Ovary of 2 glabrous carpels adnate to the disk; style slender; stigma cylindric, with a spreading ring below and conical tip. Fruit not seen.

Sumatra: near Bijin Telok, 500 ft., Forbes 3236. Haviland's No. 3048 from Kuching, Borneo, resembles this very closely, but has the leaves more lanceolate and longer acuminate.

31. Micrechites, Miq.

Large climbing shrubs with pubescent inflorescence, otherwise glabrous. Leaves opposite, penninerved. Flowers small, in axillary and terminal dichotomous thyrsoid or brachiate panicled cymes. Calyx small, deeply 5-fid or 5-partite, with obtuse lobes, many-glandular within. Corolla subhypocrateriform; the tube ovoid-campanulate, naked at the mouth; lobes 5 falcate, very oblique, sometimes forked, the upper half deflexed in bud, overlapping to the right. Stamens inserted near the bottom of the tube, included; filaments short; anthers sagittate, conniving round and adhering to the stigma; cells produced at the base into empty spurs. Disk annular or cupular, entire or 5-lobed. Ovary of 2 distinct carpels, longer than the disk; style short; stigma ovoid or oblong, with a short obtuse apiculus; ovules very many. Fruit of 2 divaricate, thick, subterete, follicular mericarps. Seeds generally few, linear-oblong, compressed, not beaked, with a terminal persistent coma;

albumen scanty; cotyledons narrowly linear, elongate; radicle very short.—Distrib. India and Malaya, about 4 species.

Leaves almost coriaceous, broad; inflorescence many-branched, many-flowered; corolla-lobes short, often forked, reflexed ... Leaves chartaceous, narrow; inflorescence scarcely branched, very few-flowered; corolla-lobes long, not forked, spreading ...

1. M. polyantha.

2. M. elliptica var. Scortechinii.

1. MICRECHITES POLYANTHA, Mig. Fl. Ind. Bat. II. 457 (1856). A slender climbing shrub; branches obscurely angled; branchlets dark brown, terete; innovations sparsely pubescent. Leaves chartaceo-coriaceous; elliptic-obovate elliptic-oblong or oblong-lanceolate, obtuse or obtusely acuminate at apex, cuneate attenuate or sometimes slightly rounded at base; glabrous on both surfaces; 2 to 4.5 in. long, 1 to 2 in. broad; midrib stout, prominent beneath; main nerves 10 to 15 pairs, slender, at an angle of 60° to 70° with the midrib, nearly straight to join in an obscure intramarginal nerve; secondary nerves many, similar to and between but more slender than the main nerves; reticulations very oblique; petiole 5 to 1 in. long, channelled above, often twisted. Cymes terminal and axillary, thyrsoid, rusty-tomentose, much branched, at length often elongating in slender bracteolate racemes, reaching 5 to 7 in. in length and 3 in. in breadth; rachises angular or flattened; peduncle 0 to 2 in. long; pedicels very short and stout, 05 to 1 in. long; bracts lanceolate, caducous; bracteoles very many, persistent, ovate, acute or obtuse. conspicuous especially after the fall of the flowers; buds ovoid or conical; flowers white. Calyx campanulate; lobes ovate, rounded, rusty-tomentose without, glabrous within, 05 to 15 in. long; the base inside furnished with minute scales mixed with villous hairs. Corolla campanulate or urceolate, 15 to 2 in. long, contracted at the mouth, glabrous without, puberulous within; lobes falcately lanceolate with a knee at the base, or bilobed, the divisions unequal, much reflexed, pubescent at the mouth, 05 to 125 in. long. Anthers acuminate. Ovary densely villous. Follicles terete, cylindric, 6 to 12 in. long, divergent at about 120° and curving upwards so as nearly or quite to meet again, acuminate at tip; pericarp thin, dark brown, glabrous. Seeds linearoblong, narrow, compressed, 1 to 1.5 in. long, somewhat enlarged at the apex and furnished with a thick, close, persistent, tawny coma 2 in. long; testa thin, dark brown; albumen scanty; cotyledons linear, very slender, 1 in. long; radicle minute. Hook. f. Fl. Br. Ind. Tabernæmontana polyantha, Blume Bijd. 1029; A. DC., III. 671. Prodr. VIII. 376.

Penang: Curtis 850; Ridley 9426. Perak: Ridley 2896; Wray 1815, 2604; King's Collector 4430, 5875, 6564, 6840, 8404, 8859, 10003.

SELANGOR: Ridley 7412. MALACCA: Maingay (K.D.) 1081.—DISTRIB. Andaman Islands, Java.

Some of the specimens examined differ in the size of the flowers, in the inflorescence, and in the greater or less bifurcation of the corolla-lobes, but we have not succeeded in separating any of them as species or even varieties, and prefer to consider them all as forms of one.

2. MICRECHITES ELLIPTICA, Hook. f. Fl. Br. Ind. III. 671 (1882). Rhyncospermum 4, Herb. Ind. Or. Hook. f. & Th.

India in Sikkim Himalaya at 4000 to 6000 ft., and Khasia Hills at 3000 to 4000 ft.

Var. Scortechinii, King & Gamble. A climbing shrub. Leaves chartaceous; lanceolate, obtusely long-acuminate at apex, cuneate at base; glabrous on both surfaces; 3 to 3.5 in. long, 1 to 1.5 in. broad; main nerves 10 to 12, very slender, not conspicuous; secondary nerves many; reticulations oblique; petiole .25 in. long. Cymes terminal or axillary, very few-flowered, scarcely reaching 1 to 1.5 in. long, minutely puberulous; pedicels slender, .2 in. long; bracteoles ovate, persistent; buds ovoid, obtuse. Calyx-lobes ovate, ciliate, rounded, .075 in. long. Corolla-tube cylindric, .1 in. long, constricted slightly at the mouth; lobes linear-oblong, .15 in. long, twisted, glabrous, much turned to the left. Anthers sagittate, acuminate; filaments very short. Ovary densely villous. Fruit not known.

Perak: Scortechini.

This may prove, when better specimens are available, to be incapable of separation from the Indian type.

Family LXXVI. ASCLEPIADACEÆ.

Herbs or shrubs, erect or more usually twining, often with a tuberous rootstock or fleshy roots; juice milky or watery; stems simple or branched, usually woody, sometimes succulent. Leaves opposite or whorled, sometimes wanting, very rarely alternate; thin or fleshy, quite entire, sometimes with an interpetiolar stipulary line or teeth. Flowers hermaphrodite, very variable in size and form but always regular; solitary or few or many together, in umbels, umbel-like cymes, fascicles or racemes, axillary, lateral between the bases of the leaves or terminal. Calyx inferior, of 5 sepals or 5-lobed; lobes imbricate, usually with minute glandular scales at the base within. Corolla hypogynous, gamopetalous, regular, 5-lobed, various in shape; tube usually short (long in Ceropegia), sometimes furnished within or at its mouth with variously shaped processes forming a corolline corona; lobes imbricate, contorted or valvate in æstivation, often recurved, sometimes more or less erect and connate at their tips. Stamens 5, inserted at or near the base of the corolla and alternate with its lobes, rarely higher up; filaments sometimes free, more usually connate in a tube around the ovary, forming with the anthers and their terminal appendages a staminal column, with the apex often united to the dilated part of the style, usually with more or less fleshy processes on the back forming a staminal corona; anthers free or united to the dilated part of the style, 2-celled; the cells dehiscing by apical longitudinal or transverse slits; the margins of the anthers or their basal prolongations below the cells more or less horny and wing-like (the anther-wings), usually projecting outwards; the adjacent wings of each pair of anthers nearly meeting and forming between them very narrow fissures leading to the stigmatic cavities; connectives of the anthers often produced into membranous rarely fleshy or inflated terminal appendages which are sometimes connate; pollen-contents of each anther-cell granular or united into one or two waxy masses (pollen-masses) formed of an indefinite number of pollengrains and attached in pairs or in fours, sometimes directly but more usually by means of arm-like caudicles to each of the 5 small, usually horny, turgid or bilobed pollen-carriers, which rest one on each of the 5 angles of the dilated part of the style, the whole forming the pollinia, the masses attached to each pollen-carrier always being derived from the cells of two different but adjacent anthers; when granular, each granule is formed of about 4 pollen-grains united together, and, on the dehiscence of the anthers, the whole is loosely contained in the horny spoon-, trumpet-, or trowel-like or bifid appendicle tapering downwards into a short or long caudicle attached to a soft (adhesive?) pollen-carrier gland. Ovary superior, of 2 one-celled, many-ovuled, carpels, free below; the styles united above and dilated into a pentagonal disk (style-apex) which is flat or depressed in the centre, with or without a conical or otherwise shaped tip, and bears on its angles the pollen-carriers and immediately beneath them, behind the fissures between the anther-wings, the 5 stigmatic cavities; ovules usually numerous, rarely few or solitary, anatropous, pendulous, imbricate in several series on the projecting placenta. Fruit of 2 (or 1 by suppression) divaricate or parallel follicular mericarps, dehiscing by the ventral suture and usually liberating the placenta; pericarp usually smooth, sometimes echinate or winged. Seeds usually flat, sometimes ovoid or cylindric, usually with a broad or narrow margin, generally crowned with a coma of long silky hairs, sometimes fringed, sometimes without any tuft; testa thin or thick; albumen usually thin, sometimes rather thick, sometimes none; embryo large, nearly or quite filling the seed; cotyledons flat; radicle usually cylindric, superior. — DISTRIB. A large Family of more than 1800 species, widely distributed over tropical and subtropical, with a few in temperate, regions.

As in the Family APOCYNACEE, in which we were much assisted by Dr. O. Stapf's account of it in the 'Flora of Tropical Africa,' Vol. IV. Sect. 1, so in ASCLEPIADACE AC we have been indebted to that by Mr. N. E. Brown in the same work, which has helped us properly to understand the morphology of a very difficult but most interesting Family of plants. We wish also to mention that much assistance was derived from the account of the Family and its Western India genera given by Dr. T. Cooke, C.I.E., in Vol. II. of his 'Flora of the Presidency of Bombay.'

ANALYSIS OF THE TRIBES.

Pollen granular, loosely contained in the more or less spathulate or bifid appendicles, not attached to the latter Pollen united into very minute waxy masses, 4 or 2 of which are sessile upon a very minute quadrate pale-coloured pollen-carrier II. Secamone A. Pollen united in waxy opaque masses without pellucid margin, usually of fair size and attached in pairs by caudicles to the dark-coloured pollen-carriers:-

I. PERIPLOCEÆ.

Pollen-masses pendulous ...

III. CYNANCHEÆ. IV. MARSDENIEÆ.

Pollen-masses erect or horizontal, very rarely pendulous Pollen united in waxy masses pellucid on one margin or at the apex, and attached in pairs by caudicles to the pollen-carriers V. Ceropegieze.

Tribe I. Periploceæ.

Filaments of the stamens free; anthers acute or with the connectives produced in terminal appendages connivent over the style-apex and frequently connate. Pollen-contents of each anther-cell of numerous loose granules, each granule formed of 3 to 4 pollen-grains united in lines or tetrads. Appendicles spathulate, trumpet-shaped or trowelshaped, sometimes bipartite, horny, attached by short or long caudicles to an adhesive pollen-carrier gland at the base, which is itself attached to the angles of the style-apex, holding the pollen-granules loosely but not attached to them.

Corona-processes none:-

Anthers with long appendages; climbers:-Anther appendages erect, thick, curving inwards at tip

1. PHYLLANTHERA.

Anther appendages erect, bearded, erect at tip Anthers with short appendages curving over the style-apex; 2. PENTANURA.

shrubs Corona-processes 5:- 3. Gongylosperma.

Corona-processes short, thick

4. Hemidesmus.

Corona-processes filiform, behind the stamens :-Stamens without alternating glands between the filaments;

corolla-lobes rounded :-

Follicles short, broad, ribbed; corolla large ... 5. FINLAYSONIA. Follicles cylindric, narrow, not ribbed; corolla small ... 6. GYMNANTHERA.

Stamens with glands between the filaments:-

Corolla-lobes elongate, linear-lanceolate; auther appen-

dages long, narrow .. 7. ATHERANDRA. . .

Corolla-lobes short, ovate; anther appendages short, thick 8. STREPTOCAULON.

1. PHYLLANTHERA, Blume.

Glabrous climbing shrubs. Leaves opposite, with nerves at right angles to the midrib, pale beneath. Flowers long-pedicelled, subracemose, reddish, in lax pedunculate cymes from one axil of a pair of leaves. Calux short, 5-fid; lobes ovate; scales 5, alternate with the lobes within, membranous. Corolla campanulate-rotate, fleshy, deeply 5-fid, papillose within; lobes suboblique, concave, overlapping to the right. Corona none. Stamens affixed near the base of the corolla; filaments free; anthers agglutinated with the style-apex, not bearded; appendages erect, thick, naked, curving inwards at the tip. Pollen granular, composed of 3 to 4 granules cross-wise adherent; pollencarriers globose, bearing short slender caudicles ending in obliquely funnel-shaped appendicles which carry the pollen-masses. Style-apex capitate, obscurely 5-angled. Fruit of 2 slender divaricate follicular mericarps. Seeds oblong; testa thin, with few silky hairs ending in a tufted long silky coma; albumen thin; cotyledons oblong; radicle cylindric, nearly as long as the cotyledons.—DISTRIB. Species 2, one of the Malay Peninsula, the other of Java.

PHYLLANTHERA PERAKENSIS, King & Gamble, n. sp. A glabrous slender climbing shrub, with thin slender terete branchlets. Leaves somewhat fleshy, membranous when dry; oblong or oblong-lanceolate. acuminate at apex, rounded at base; glabrous on both surfaces, the lower pale, almost glaucous; margins recurved; 2.5 to 4 in. long, .75 to 1.25 in. broad; midrib prominent, impressed above, raised beneath; main nerves 8 to 10 pairs at right angles to the midrib, obscure, slender, straight to join an intramarginal looped nerve at the sinus of the loops: secondary nerves very few, between and parallel to the main nerves. very obscure; reticulations not visible; petiole slender, 25 to 5 in. long, slightly thickened below. Cymes few-flowered; peduncles slender, up to about 25 in. long; branches usually 2, reaching 5 in. in length, subracemose, with pairs of persistent small ovate acute scarious bracts; pedicels very slender, about 25 in. long; buds globose; flowers reddishbrown or mottled red and yellow. Calyx-lobes ovate, hyaline, 05 in. long; scales 1 to 2 in. long, membranous. Corolla-lobes orbicular, imbricate, 2 to 3 in. long, minutely papillose within; tube very short. Anthers with appendages 05 to 075 in. long. Follicles slender, 6 to 7 in. long, 25 in. broad, the tip hooked inwards, divaricate in one straight line; pericarp smooth, thin, dark brown, striate. Seeds many, oblong, ridged on the ventral surface, 3 in. long, 06 in. broad, with a few sparse white hairs and a deciduous silky white spreading coma 1.5 to 2 in. long; testa thin, dark brown; albumen very thin; cotyledons oblong, rather fleshy, 15 in. long, 05 in. broad; radicle cylindric, 1 in. long.

Perak: at Kota, Wray 2407, 3005; Scortechini; at Larút, King's Collector 2059, 2181, 7314.

This species comes very near to the Javanese *P. bifida*, Blume, but the latter has narrower and longer leaves, with very many (20 to 25) pairs of main nerves and many secondary ones with the intramarginal nerve much nearer the margin. The peduncles and branches of the cyme and the pedicels are stouter and longer and the corolla more fleshy. The anthers are similar, but the pollen-carrier appendicles are more obliquely funnel-shaped (see t. xxii. in Bl. Mus. Bot. Lugd.-Bat. I.). The only specimen in the Kew Herbarium is "Coll. T. Lobb, India 1868," and may be possibly from the Peninsula. In the Calcutta Herbarium are specimens from Sumatra (*H. O. Forbes* 2436).

2. Pentanura, Blume.

Glabrous climbing shrubs. Leaves opposite, with nerves at right angles to the midrib or nearly so. Flowers 1 to 3, on bracteate pedunculate racemose cymes in the axils of or opposite to one leaf of the pair. Calyx small, 5-fid, with 5 membranous scales alternate with the lobes within. Corolla campanulate-rotate, fleshy, deeply 5-fid, papillose within; lobes oblong, concave, overlapping to the right. Corona none. Stamens affixed near the base of the corolla, the bases distant, geniculate: filaments free; anthers agglutinated with the style-apex, oblong, not bearded; appendages lanceolate, bearded, caudiform, erect at tip. Pollen granular, composed of 3 to 4 granules cross-wise adherent pollen-carriers discoid, bearing slender caudicles and spathulate often truncate appendicles which carry the pollen-masses. Style-apex capitate, sharply 5-angled. Fruit of 2 slender divaricate follicular mericarps. Seeds oblong, with few silky hairs ending in a tufted long silky coma; testa thin; albumen thin; cotyledons oblong; radicle cylindric.—DISTRIB. Species 2, one of the Khasia Hills and Yunan. the other of the Malay Peninsula and Archipelago.

This genus comes very near to *Phyllanthera*, with which we are inclined to think it might be incorporated. It differs in the markedly pentagonal style-apex, the bearded anther appendages, and the spathulate not funnel-shaped appendicles of the pollen-carriers. *P. khasiana*, Kurz, Fl. Br. Ind. IV. 4, hardly seems to us to belong to this genus.

Pentanura sumatrana, Blume Mus. Bot. Lugd.-Bat. I. 125, t. xxi. (1849). A glabrous slender climbing shrub, with thin angled or striate branchlets, bearing occasional round lenticels. Leaves chartaceous; elliptic, rather abruptly acuminate at apex, cuneate at base; glabrous on both surfaces, the lower pale, almost glaucous; the margins strongly recurved; 3 to 4 in. long, 1.25 to 1.75 in. broad; midrib slender, slightly impressed above, raised beneath; main nerves 7 to 8 pairs, slightly raised beneath, at or a little less than right angles with

the midrib, straight to join an intramarginal looped nerve; secondary nerves few, very faint; reticulations not visible; petiole 25 in. long, channelled above, sometimes bearing small stipular glands at the base. Racemes up to 2 in. long, 1- to 3-flowered, with pairs of persistent ovate scarious bracts; pedicels slender, 15 in. long; buds ovoid, acute; flowers deep red. Calyx-lobes ovate, acute, hyaline, 1 in. long, with ovate acute membranous scales .03 in. long between each at the base within. Corolla-lobes oblong or obovate-oblong, 5 in. long by 3 in. broad, minutely papillose within; tube salver-shaped at base. Appendages of stamens erect, bearded, about '03 in. long; appendicles of pollen-carriers as long. Follicles slender, 5 to 6 in. long, 2 in. broad, very acute, divaricate in a straight line, tips straight; pericarp thin, rough, striate, dark brown. Seeds many, oblong, ridged on the ventral surface, 275 in. long, 075 in. broad, with a few sparse white curly hairs and a deciduous silky white spreading coma about 1.5 in. long; testa thin, dark brown; albumen thin; cotyledons oblong 15 in. long by 05 in. broad; radicle cylindric, Miq. Fl. Ind. Bat. II. 471; Engl. & Prantl Naturl. ·1 in. long. Pflanzenfam. IV. 2, 211, fig. 63, D.E.

Perak: at Relan Tujor, Wray 1847, 4025; Scortechini 1303; King's Collector 1825, 3514.—Distrib. Sumatra (Prætorius, Beccari 640).

3. Gongylosperma, King & Gamble, nov. gen.

A shrub. Leaves opposite, strongly nerved. Flowers in axillary or pseudo-terminal, bracteate, paniculate cymes; the branches 2- to 3-chotomous; pedicels slender. Calyx short, 5-partite: scales combined in a ring. Corolla rotate-campanulate; the tube short; lobes oblong, overlapping to the right. Corona none. Stamens inserted on the corollatube; filaments free, broad and nearly confluent at base; anthers short; appendages short, triangular, incurved over the style-apex; pollengranules elongate, of 3 to 4 pollen-grains in one line; pollen-carriers minute, appendicles spathulate. Ovary of 2 carpels; styles distinct below, combined above; style-apex obscurely 5-angled, flattened at top. Fruit of 2 short divaricate oblong follicular mericarps; pericarp thin, pubescent. Seeds very small, oblong-cylindric, with a white silky coma; albumen copious; cotyledons fleshy; radicle cylindric.—Distrib. A single species only as so far known.

Gongylosperma Curtisii, King & Gamble, n. sp. A small shrub; branches smooth, brown. Leaves coriaceous; lanceolate or oblong-lanceolate, acute at apex, attenuate at base; both surfaces rugose, the upper slightly puberulous, the lower pubescent, both ashy grey, the lower much the paler; margins recurved; 2.5 to 4.5 in. long, .75 to 1.75

in. broad; midrib as well as all nerves and reticulations impressed above, raised beneath; midrib thick; main nerves stout, 18 to 20 pairs, at about 60° with the midrib, nearly straight to join an obscure intramarginal looped nerve close to the margin; secondary nerves few; reticulations closely netted; petiole rather stout, 15 to 25 in. long. Cymes more or less grey-puberulous, reaching 1.5 in. long and 2 in. broad; peduncle stout, 25 to 5 in. long; branches 3-chotomous secondary branches again 3-chotomous, both furnished with pairs of small ovate acute bracts; pedicels slender, 15 in. long; buds ovoid, acute. Calyx short; tube very short; lobes ovate, acute, hyaline on the margins, glandular dotted; scale-ring narrow. Corolla-tube short, lobes oblong, blunt, 15 in. long. Corona none. Stamens few; filaments rather thick, enlarged and almost confluent at the base; anthers short, rounded; appendages triangular, black, curved over the style-apex and connate. Styles short, stout; style-apex obscurely 5-angled, flattened at top. Follicles straight, thick, 1 to 1.25 in. long, 25 in. broad, divaricate in a straight line, tip slightly incurved, blunt; pericarp thin, minutely grey-pubescent. Seeds oblong-cylindric, 1 in. long and 05 in. thick, ending in a sparse white silky coma 2 in. long; testa granular, very thin; albumen copious; cotyledons elliptic, fleshy, 06 in. long; radicle cylindric, a little shorter than the cotyledons.

SIAM STATES: at Poongah, in the crevices of limestone rocks. Curtis 2951.

4. Hemidesmus, Br.

Twining shrubs. Leaves opposite or in whorls of 4. Flowers small, greenish-purple, in opposite crowded subsessile cymes. Calyx 5-partite; lobes acuminate; with 5 minute scales between them at their bases within. Corolla rotate, deeply 5-fid, with valvate fleshy lobes; tube very short. Corona-processes 5, short, thick, on the throat of the corolla and alternate with its lobes. Stamens inserted at the base of the corolla-tube; filaments distinct or subconnate at the base; anthers small, cohering at the apex, terminated by inflexed appendages; pollen-masses cohering in pairs in each cell, granular; the caudicles of the pollen-carriers thick below, then slender, bearing cucullate or spreading appendicles. Style-apex 5-lobed, flat on the top. Fruit of 2 slender divaricate terete follicular mericarps. Seeds oblong, flattened, ridged on the ventral face, ending in a broad tip bearing a long silky coma; albumen scanty; cotyledons oblong, fleshy; radicle cylindric.—Distrib. India and Malaya; species 1 or 2.

Hemidesmus indicus, Br. in Mem. Wern. Soc. Edinb. I. 57 (1811). A prostrate or twining shrub, with slender terete branchlets; older branches dark brown, with prominent wart-like lenticels. Leaves chartaceous, very variable, in pairs or whorls of 4, of which one pair shorter than the other; elliptic-oblong to linear-lanceolate, acute or mucronate at apex, rounded at base; glabrous on both surfaces, the upper sometimes variegated with white, the lower often pale; margins recurved; 2 to 4 in. long, 5 to 75 in. broad (our specimen); midrib slender, raised beneath or flattened; main nerves 4 to 5 pairs, curving upwards and meeting near the margin; reticulations obscure; petiole ·15 to ·25 in. long, slender. Cymes opposite, on very short peduncles; flowers on short pedicels with many ovate-acute bracts. Calyx-lobes ovate-acute, membranous, 05 in. long; scales minute. Corolla-lobes ovate-oblong, acute; tips incurved; 15 to 25 in. long. Corona-scales often emarginate. Follicles cylindric, 4 to 7 in. long, spreading at 180° apart or slightly curved backwards from the straight line; tips slightly hooked; pericarp thin, smooth. Seeds ovate-oblong, flattened, ridged on the ventral face; testa granulate on one side and the margin, smooth on the other; cotyledons oblong; radicle slightly shorter than cotyledons. Wall. Cat. 8243; Wight Contrib. 63, Ic. t. 594; Deless. Ic. Sel. V. t. 55; Dene. in DC. Prodr. VIII. 494; Miq. Fl. Ind. Bat. II. 465; Benth. & Trim. Med. Pl. t. 174; Hook. f. Fl. Br. Ind. IV. 5; Trimen Fl. Ceyl. III. 144; Cooke Fl. Bomb. II. 147; Prain Beng. Plants 686; Engl. & Prantl Naturl. Pflanzenfam. IV. 2, 218, fig. 63, H. J. H. Wallichii, Miq. Pl. Hohenack. No. 359. Periploca indica, Willd. Sp. Pl. I. 1251. Asclepias pseudo-sarsa, Roxb. Hort. Beng. 20, and Fl. Ind. II. 39, excl. syn.—Burm. Thes. Zeyl. t. 83, fig. 1. "Naru-nundi," Rheede Hort. Mal. X. t. 34.

DINDINGS: at Bruas Road, Curtis.—DISTRIB. India, Ceylon.

The only specimen available was a very poor one with only one or two nearly rotten flowers, but there seems no reason to doubt its identification.

5. Finlaysonia, Wall.

A lofty glabrous climbing shrub with milky juice. Leaves opposite. Flowers in 2- to 3-chotomous axillary cymes, moderate-sized, yellowish and purple. Calyx short, 5-partite. Corolla rotate, deeply 5-fid; the lobes broad, ovate, overlapping to the right. Corona-processes 5, filiform, close behind the stamens. Stamens inserted at the throat of the corolla; filaments slender; anthers adnate to the style-apex by the middle, ending in broad inflexed membranous acute appendages; pollen-masses cohering in pairs in each cell; pollen granular; pollen-

carriers glandular, attached to the angles of the style-apex; appendicles slender, dilated above in a small rounded apex. Style slender; style-apex large, fleshy, truncate and 5-angled at base, convexly conical above. Fruit of 1 or 2 divaricate, fleshy, broad, follicular mericarps; the sides with 1 to 4 longitudinal ribs; the tip incurved. Seeds lax, flattened, ovate, with short rufous hairs at the margins, coma none; testa thin; albumen scanty; cotyledons broadly oblong, fleshy; radicle short, stout.—Distrib. India and Malaya; 1 species.

FINLAYSONIA OBOVATA, Wall. Pl. As. Rar. II. 48, t. 162 (1831), and Cat. 4466A. A lofty glabrous climbing shrub with milky juice; branches stout, obtusely angular, with pale brown papery, lenticellate bark. Leaves coriaceous; obovate, obtuse or shortly apiculate at apex, cuneate at base; both surfaces glabrous, the lower glaucescent; margins slightly recurved; 3 to 5 in. long, 1.5 to 2.5 in. broad; midrib broad, slightly impressed above, flattened beneath; main nerves 7 to 9 pairs, at about 70° with the midrib, straight to join in an obscure looped intramarginal nerve; secondary nerves few; reticulations many, indistinct; petiole ·5 to 1 in. long. Cymes 2 to 3 in. long; peduncle thick, often reddish, ·75 to 1 in. long; branches divaricate, ·25 to ·5 in. long, usually 3: subsequent branches usually 2, short, stout; pedicels slender, :15 in. long; bracts ovate, acute, sheathing the bases of the branches; buds ovoid; flowers yellowish with purple markings. Calyx-lobes ovate, acute, ciliate, 05 in. long; scales very minute. Corolla-lobes nearly orbicular, spreading, furnished within with long whitish hairs on a part only, glabrous without, 2 to 3 in. long. Corona-processes flexuose, '06 in. long. Follicles thick, ventricose, about 3 in. long by 2 in. broad, broadest in the middle; tip thick, blunt, hooked; ribs 3 to 4, slightly winged; pericarp thin. Seeds ovate, 7 to 8 in. long by 4 in. broad, flat; the margins winged and bordered by a few long, reddish, applied hairs, extending in a short tuft at the tip; testa thin, brown. keeled on the ventral surface; albumen thin; cotyledons oblong, fleshy, ·45 in. long, ·25 in. broad, veined; radicle thick, ·15 in. long. Wight Contrib. 65; Wight Ill. t. 182, fig. 5; Griff. Notul. IV. 70, and Ic. Pl. Asiat. t. 407; Dene. in DC. Prodr. VIII. 494; Miq. Fl. Ind. Bat. II. 464; Hook. f. Fl. Br. Ind. IV. 7; Kurz For. Fl. II. 197; Prain Beng. Plants 686; Engl. & Prantl Naturl. Pflanzenfam. IV. 2, 211, fig. 64, c.D. Gurua obovata, Ham. in Voigt Hort. Sub. Calc. 544.

SIAMESE STATES: at Kasoom, Curtis 3246. PENANG: at Butterworth, Curtis 483. PERAK: Scortechini 1104. SELANGOR: among mangroves at Kwala Selangor, Ridley 7565. MALACCA: Maingay (K.D.) 1104. SINGAPORE: Ridley.—DISTRIB. India (Sundarbans), Burma (Griffith, Helfer 3749). A plant of the river deltas.

The description of Wallich is most detailed, and, it may be mentioned here, gives a brief account of Mr. George Finlayson, in whose honour the genus was named.

6. GYMNANTHERA, Br.

Glabrous climbing shrubs. Leaves opposite. Flowers in short axillary peduncled cymes, usually 2-branched; branches racemose pedicels slender. Calyx short, 5-partite, with 5 or 10 or more minute membranous scales within at the base. Corolla hypocrateriform or rotate; the lobes spreading, overlapping to the right. Corona-processes 5, filiform on a broad base, often bifid, affixed to the corolla-tube closely behind the stamens and subconnate with them. Stamens inserted in the tube of the corolla; filaments short, slender above, dilated at the base and subconnate; anthers adherent to the style-apex, produced above in acuminate connivent appendages; pollen granular, in several masses in each anther-cell; the granules elongate, of 3 to 4 grains lineally arranged; pollen-carriers large, glandular; caudicles slender, appendicles spathulate, carriers attached to the style-apex. short; style-apex convex, 5-lobed at base. Fruit of 2 cylindric divaricate follicular mericarps. Seed not known.—Distrib. About 5 species: of the Malay Archipelago and tropical Australia.

GYMNANTHERA INSULARUM, King & Gamble, n. sp. A climbing shrub; branches woody, thick, rough, with dark brown smooth bark and occasional lenticels. Leaves chartaceous; elliptic or elliptic-oblong, rounded with a short acumen at apex, attenuate at base; upper surface dark brown when dry, lower greyish-white, both surfaces glabrous; margins slightly recurved, 2.5 to 3.5 in. long, 1 to 1.5 in. broad; midrib prominent, pale, impressed above, raised beneath; main nerves 12 to 14 pairs, at about 70° with the midrib, slightly curved upwards to join a faint intramarginal looped nerve; secondary nerves faint, short; reticulations netted, impressed above when dry; petiole slender, 5 to 75 in. long, channelled above. Cymes puberulous, about as long as the petiole: peduncle short, 2 in. long; branches 2, racemose, with many pairs of minute, ovate, acute bracts; pedicels rather stout, 15 in. long; buds ovoid. Calyx very small; lobes scarcely .025 in. long, margins hyaline; scales very small, 5 opposite to and 5 alternate with the lobes. Corollatube very short; lobes ovate-oblong, acute, 15 to 2 in long, slightly overlapping to the right, reflexed in flower. Corona-processes 5, behind the filaments, bifid; the lobes subulate, inner one the longer, :03 in. long. Stamens inserted on the corolla-tube; filaments slender, broadened and connected at base; anthers rounded; connective produced in an acuminate tip; pollen granular, in many masses, each made up of 3 to 4

grains adherent lineally. Style short, rather slender; style-apex 5-angled below, convex above. Fruit and seeds not known.

Керан: small islands near Langkawi, Curtis 3684.

7. ATHERANDRA, Done.

Slender glabrous climbing shrubs. Leaves opposite. Flowers in lax axillary and terminal peduncled dichotomous cymes. Calyx-tube turbinate, 5-partite, patent in end; scales 5, quadrate, crenulate. Corolla rotate; tube short, narrowed at the base; lobes elongate, slender, linear-lanceolate, overlapping to the right, twisted to the left in end. Corona-processes 5, filiform, at the back of the bases of the filaments. Stamens inserted at the base of the corolla-tube; filaments free, alternate with erect glands; anthers ovate, subhastate at base, connate with the style-apex; appendages long, acute, membranous, combined in a cone over the style-apex; pollen-carriers of a viscid basal gland attached to the base of the style-apex; appendicles oblong-spathulate, bearing many pollen-granules of 4 grains arranged in line or in tetrads. Ovary conical, sunk in the calyx-tube; style slender, short; style-apex long, conical, 5-lobed at base. Fruit not known.—Distrib. One species.

ATHERANDRA ACUTIFOLIA, Dene. in DC. Prodr. VIII. 497 (1844). A slender twining shrub; branchlets dark brown, slightly rough; innovations puberulous. Leaves chartaceous when dry; oblong-lanceolate or obovate-oblong, acute or cuspidate at apex, attenuate and then rounded at base; glabrous on both surfaces and reddish or greyish black when dry, dark on the upper, almost glaucous on the lower; margins slightly recurved; 2 to 3.5 in. long, .75 to 1.75 in. broad; midrib slender, raised beneath, sometimes puberulous; main nerves 5 to 8 pairs, very slender, arching upwards to and along the margin; secondary nerves few, reticulations inconspicuous; petiole slender, 2 to 4 in. long. Cymes very slender, reaching 3 in. in length and about the same in breadth; peduncles slender, about 1 in. long; branches capillary, nearly as long; bracts in pairs, linear-subulate, 1 to 15 in. long; pedicels capillary, curved, 75 in. long, somewhat enlarged under the calyx; buds conical, acuminate, 5 in. long; flowers few, brownish-yellow, distant. Calyx-tube turbinate, with 5 small scales at the throat; lobes spreading, lanceolate, 06 in. long. Corolla-tube very short; lobes linear, 75 in. long, twisted in bud to the right, then straight, recurved in flower. Corona-processes filiform, nearly 1 in. long, behind the stamens. Fruit and seeds not known. Miq. Fl. Ind. Bat. II. 467; Hook. f. Fl. Br. Ind. IV. 9. A. pubescens, Blume Mus. Bot. Lugd.-Bat. I. 147, t. xxvi; Miq. l.c. 468. A. cuspidata, Blume l.c.; Miq. l.c. Cryptolepis filiformis, Wall. Cat. 4458.

Kedah: at Coah, Langkawi Island, Curtis 2591. Penang: Wallich 4458.—Distrib. Java (Lobb, &c.).

In Curtis' specimen the glands between the filaments are very small or sometimes none; but otherwise the specimen agrees well enough with Wallich's.

8. STREPTOCAULON, Wight & Arn.

Twining herbs and shrubs, usually tomentose. Leaves opposite. Flowers small, often minute, in lax sessile or peduncled trichotomous panicled cymes in one axil only of a pair of leaves. Calyx minute, 5-partite, with 5 scales within at the base. Corolla rotate; tube very short; lobes ovate, slightly overlapping to the right; buds conical or pyramidal. Corona-processes filiform, adnate to the backs of the filaments. Stamens inserted at the base of the corolla; filaments very short, alternating with minute glands; anthers oblong, adherent to the style-apex; appendages small, black, triangular, connate over the style-apex; pollen-carriers of a viscid gland attached to the base of the style-apex; appendicles spathulate-funnel-shaped; pollen-masses 2 in each anther-cell composed of pollen-granules, each of which consists of 3 to 4 grains arranged in lines or tetrads. Ovary of 2 distinct carpels: style short; style-apex 5-angled, depressed, top convex. Fruit of 2 divaricate follicular mericarps, usually pubescent. Seeds flattened, keeled on the ventral surface, oblong; tip broad, surmounted by a long white silky coma; testa very thin; albumen very scanty; cotyledons ovate-oblong, flat; radicle cylindric, nearly as long as cotyledons.—DISTRIB. 6 to 7 species, of India and the Malay Peninsula and Archipelago, and the Philippine Islands.

Main nerves of leaf 6 to 8 pairs; corolla-lobes under 1 in. long; follicles under 3 in. long 1. S. Wallichii.

Main nerves of leaf 14 to 18 pairs; corolla-lobes over 1 in.
long; follicles over 3 in. long ... 2. S. Griffithii.

1. Streptocaulon Wallichi, Wight Contrib. 65 (1834). A slender climbing shrub with very milky juice; branchlets slightly angled, with dark brown bark and occasional small lenticels, uppermost and innovations densely shortly brown-pubescent. Leaves subcoriaceous; elliptic or elliptic-lanceolate, acute with a short apiculus at apex, cuneate at base or occasionally rounded; upper surface dull brown when dry and puberulous, lower densely and softly brown-tomentose; margins slightly recurved; 2 to 5 in. long, 1 to 2.5 in. broad; midrib slender, slightly impressed above, prominent beneath; main nerves 6 to 8 pairs, at an angle of about 60° with the midrib, curved gradually upwards to

and along the margin; secondary nerves none; reticulations minutely netted but not prominent; petiole 25 to 5 in. long, channelled above. Cymes spreading, much-branched, many-flowered, hispidly pubescent, reaching 1.5 to 2 in. long and 2 to 2.5 in. broad; peduncles usually short. about 25 in. long; branch peduncles 5 in., rest gradually shorter; bracts many, in pairs, small, ovate-acuminate; pedicels slender; buds ovoid-pyramidal; flowers glabrous, reddish. Calyx-tube turbinate: lobes ovate-oblong, 025 in. long, often emarginate, hyaline at the edges: scales minute, obtuse. Corolla-tube very short, cylindric, then rotate; lobes oblong, 075 in. long, obtuse, tips incurved. Corona-processes ·03 in. long, tips glandular. Follicles slender, 3 in. long, ·3 in. broad, divaricate in a straight line, tips slightly hooked; pericarp thin, densely grevish-tomentose. Seeds oblong, rounded at base, keeled on the ventral surface, 25 in. long by 05 in. broad, broad at tip and with a thick white silky coma 1 to 1.25 in. long; testa thin, brown, shining; albumen very scanty; cotyledons ovate-oblong, acute, 1 in. long; radicle slender, cylindric. Wall. Cat. 8249B; Done. in DC. Prodr. VIII. 496; Miq. Fl. Ind. Bat. II. 469; Hook. f. Fl. Br. Ind. IV. 9.

Kedah: on Lankawi Island, Ridley 8295; Bell in Cantley 229.
Kelantan: Ridley of. Trans. Linn. Soc., Ser. 2, III. 320. Penang: Phillips; Maingay (K.D.) 1100; Deschamps; Stoliczka; G. King; Curtis 472, 2122; Ridley 9484; King's Collector 4910, 5188. Province Wellesley: at Arakuda, Ridley 6972. Perak: Scortechini; King's Collector 2509; Ridley 3072. Singapore: Wallich 82498.

2. STREPTOCAULON GRIFFITHII, Hook. f. Fl. Br. Ind. IV. 10 (1883). A climbing shrub; branchlets dark purplish-brown, pubescent; innovations hispidly tomentose. Leaves subcoriaceous; obovate-oblong or oblanceolate, shortly acuminate at apex, narrowed and finally rounded or cordate at base; upper surface greyish and puberulous, lower densely greyishbrown-tomentose; margin slightly reflexed; 3 to 4 in. long, 1 to 2 in. broad; midrib stout beneath, more slender and impressed above; main nerves 14 to 18 pairs, at about 60° with the midrib, at first straight, then curved to and along the margin; secondary nerves none; reticulations minutely netted, the larger ones transverse between the main nerves, all slightly impressed above and raised beneath; petiole 25 in. Cymes dichotomous, hispidly tomentose, 1 to 2 in. long and broad; peduncle 25 in. long; branches furnished with many pairs of opposite persistent ovate-acute hirsute bracts; petiole slender, 15 in. long; buds ovoid-conic. Calyx-tube turbinate; lobes ovate-acute, hirsute without, glabrous within; margins hyaline; scales minute, 2- to 3-fid. Corolla-tube very short or none; lobes rotate, ovate-acute, 1 to 15 in. long, glabrous but minutely puncticulate without. Coronaprocesses filiform, on a conical base in a discoid ring. Pollen-carrier appendicles broadly linear, bifid. Follicles slender, straight, 3 to 4 in. long, 5 in. broad, recurved to about 270°; tips slightly hooked; pericarp chartaceous, minutely pubescent without, smooth within. Seeds oblong, contracted above in a short neck, truncate at tip, also at base, keeled on the ventral surface, 3 in. long, 1 in. broad; tip with a dense white silky coma about 1 in. long; testa thin, black; cotyledons ovate, acute, 125 in. long; radicle slender, cylindric 075 in. long. Streptocaulon, Griff, Notul, IV, 71, and Ic. Pl. Asiat. t. 406.

JOHORE: at Batu Pahut, Ridley 11120.—DISTRIB. Burma (Tenasserim, Helfer (K.D.) 3754; Mergui, Griffith), Siam (Schomburgk), Tonkin.

Tribe II. SECAMONEÆ.

Filaments of the stamens connate into a tube and adnate at top to the dilated part of the style; appendages of the anthers more or less fimbriate. Pollen-contents of each anther-cell of two very minute distinct waxy masses sometimes combined into one. Pollen-carriers minute, subquadrate, soft; the pollen-masses attached to them in fours or pairs.

Corolla-lobes imbricate, usually glabrous or merely puberulous within:—

Corolla-lobes valvate, villous within

9. SECAMONE, Br.

.. 12. GENIANTHUS.

Climbing or straggling shrubs or undershrubs. Leaves opposite. Flowers small, often minute, in lax axillary sessile or shortly peduncled 2-3-chotomous cymes. Calyx 5-partite, without scales within. Corolla small, rotate, 5-lobed; lobes overlapping to right or left; tube very short. Corona-processes 5, adnate to the staminal-column, compressed. Stamens inserted at the base of the corolla; filaments connate at the base only; anther-tips ending in a small inflexed appendage, connivent around the style-apex; pollen-masses very minute, globose or slightly oblong, in pairs in each cell, attached in fours to the minute pollen-carriers, without caudicles. Ovary of 2 carpels; style columnar,

dilated, ending in a flattened ring and produced in a beak above it; style-apex rounded or bifid, exserted beyond the anthers. Fruit of 2 divaricate follicular mericarps, terete or angular, acuminate, smooth. Seeds flattened, oblong, ending in a long white silky coma; albumen scanty; cotyledons linear-oblong; radicle rather long, cylindric.—Distrib. Species about 30, chiefly of South and Tropical Africa and the Mascarene Islands; a few in India, Malaya, and the islands, extending to Australia.

SECAMONE MICRANTHA, Done. in DC. Prodr. VIII. 501 (1844). A small climbing shrub; branchlets slender, terete, the size of a crowquill; nodes enlarged. Leaves membranous; ovate-lanceolate, acuminate and apiculate at apex, attenuate at base; both surfaces olive-green when dry, the lower paler, glabrous; margins recurved; 1.5 to 3 in. long, ·35 to 1 in. broad; midrib slender; main nerves about 8 to 10 pairs, obscure, curving acutely upwards to meet an obscure intramarginal nerve; reticulations scarcely visible; petiole slender, 1 to 25 in. long. Cymes spreading, pubescent, 1 to 2 in. long and the same broad; sually 2-chotomous below, 3-chotomous above; main peduncle variable, reaching 1 in. long; branch peduncles slender, flexuous, often zigzag, about 25 in. long; pedicels 1 in.; bracts very small, ovate-acute, hispidly hairy; buds globose; flowers pale yellow. Calyx deeply cleft, lobes ovate, ciliate on the margins, scarious above, black-gland-dotted on the claw, 05 in. long. Corolla-lobes deeply cleft, glabrous, 075 in. long, obtuse, 3-nerved. Corona-processes very narrow, compressed, with a rounded tooth on the back. Follicles 2, slender, divaricate in a straight line (180°) or nearly so, 3 in. long, 3 in. broad; acuminate tips slightly incurved; pericarp thin, glabrous, striate. Seeds ovate-spathulate, truncate at tip, flattened, submembranous on the margins, bearing a copious white silky coma, 5 in. long, ·125 in. broad; testa thin, brown, shining. Miq. Fl. Ind. Bat. II. 472. Tylophora micrantha, Dene. Herb. Tim. Desc. in Nouv. Ann. Mus. Sc. III. (1834) 377.

SIAMESE STATES: Trang, King's Collector 1414. KEDAH: on Langkawi Island, Curtis 2800. Penang: Curtis 225, 992, 1896.—Distrib. Java, Timor.

We cannot separate from this S. Finlaysonii, Wight Contrib. 61 (1834); Wall. Arch. No. 103, probably from Siam.

10. Toxocarpus, Wight & Arn.

Twining shrubs. Leaves opposite. Flowers small or moderatesized, in axillary dichotomous paniculate or racemose cymes. Calyx minute, 5-partite, with or without 5 minute scales within at the base. Corolla shortly subrotate or campanulate, 5-fid; tube short or about as long as the lobes; lobes linear-oblong, recurved, overlapping to the left. Corona-processes 5, attached to the staminal tube, dorsally flattened, toothed, the tooth usually curving upwards. Stamens inserted at the base of the corolla; filaments connate; anthers small, erect or connivent around the style-apex; appendages often minutely fimbriate; pollen-masses very minute, pendulous, single or obscurely in pairs in each cell, attached to minute pale soft pollen-carriers, without caudicles. Ovary of 2 carpels; style slender; style-apex columnar or clavate, produced far beyond the anthers; tip often bifid. Fruit of 2 divaricate follicular mericarps; pericarp smooth. Seeds oblong, flattened, tipped with a silky coma; testa thin; cotyledons oblong; radicle cylindric.—Distrib. Species about 20; found in India, Malaya and Tropical Africa.

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Corolla-tube much shorter than the lobes :-
  Corolla-lobes linear, twisted when open; style-apex long-
  acuminate:-
    Cymes reaching 2 in. in length; leaves more or less elliptic;
                                                           .. 1. T. Griffithii.
    follicles 12 in. long and slender ..
    Cymes scarcely reaching .5 in. long; leaves more or less
    obovate; follicles linear-lanceolate, ·4 in. long
                                                           .. 2. T. Curtisii.
  Corolla-lobes obovate-oblong, not twisted; style-apex pyri-
  form :--
                                                                3. T. Scortechinii.
Corolla campanulate; tube longer than lobes:-
    Cymes rusty-pubescent, reaching 2 in. long; leaves lanceolate 4. T. penangianus.
    Cymes pubescent, under 1 in. long; leaves elliptic
                                                            .. 5. T. lankawiensis.
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1. Toxocarpus Griffithii, Done. in DC. Prodr. VIII. 505 (1844). A slender climbing shrub; branchlets slender, more or less hispid with purplish-brown stiff hairs; nodes swollen. Leaves chartaceous; elliptic-oblong or -lanceolate, cuspidately acuminate at apex, cuneate at base; both surfaces glabrous except the midrib and main nerves beneath, upper grevish-brown, lower grevish when dry; margins recurved; 2 to 4 in. long, 1 to 2 in. broad; midrib slender, slightly impressed above, raised beneath; main nerves 6 to 7 pairs, curving upwards to and along the margin where they anastomose; secondary nerves few; reticulations irregular, fairly prominent beneath when dry; petiole slender, twisted, 3 to 5 in. long. Cymes shorter than the leaves, reaching 2 in. in length, rusty-pubescent; peduncle about ·25 in. long; branches 2 to 3, racemosely paniculate; the flowers in small clusters on a somewhat zigzag red rachis; bracts many, persistent, ovate-acute; pedicels very short; buds conical; flowers creamy white. Calyx pubescent without; lobes ovate-oblong, 05 in. long. Corolla-lobes linear-oblong, glabrous except for slight pubescence near the base within, '075 in. long, twisted; tube very short. Corona-processes adherent to and as long as the staminal tube, the back with a short upturned tooth. Style-apex produced, ovate-clavate, acuminate and bifid at tip. Follicles 12 in. long, '15 in. broad, very slender, flexuous, slightly torulose; pericarp crustaceous, puberulous. Seeds 1 in. long, linear, very slender, obliquely truncate at apex and furnished with a thick coma of silky hairs 1 to 1.25 in. long; testa dark brown, granular; cotyledons oblong, thin. Hook. f. Fl. Br. Ind. IV. 13. Toxocarpus sp., Griff. Notul. IV. 69, and Ic. Pl. Asiat. t. 404 (Asclepiadeæ). Connaracea, Wall. Cat. 8550.

Penang: Porter. Perak: at Sungie Larút, Wray 2465; in dense jungle on low wet ground near Larút, King's Collector (Kunstler) 6205. Malacca: Maingay (K.D.) 1105. Singapore: Lobb 45.—Distrib. Burma (in Mergui, Griffith 8550; Helfer 3758).

2. Toxocarpus Curtisii, King & Gamble, n. sp. A slender climbing shrub; branchlets pustular, dark brown, striate, the uppermost rusty-pubescent, nodes slightly swollen. Leaves elliptic or ellipticobovate, shortly and bluntly acuminate at apex, cuneate at base; both surfaces olive-grey, upper darker and shining, lower sparsely rustypubescent when young; margins recurved; 2 to 3.5 in. long, 1.25 to 2 in. broad; midrib prominent, impressed above, raised beneath; main nerves distant, 4 to 8 pairs, starting at an angle of 60° with the midrib and arched upwards to join in an intramarginal looped nerve as prominent as themselves and like them raised beneath; secondary nerves few, obscure; reticulations irregular; petiole 2 to 5 in. long, slender, twisted. Cymes axillary, tawny-pubescent, sessile or on very short peduncles; branches 2 to 3, subracemose; the flowers in bracteate clusters; bracts small, lanceolate; pedicels short; buds conical, acuminate. Calyx thickly rusty-pubescent without; lobes ovateacuminate, '05 in. long; scales alternate with the lobes, very minute or 0. Corolla glabrous on both surfaces; tube short; lobes linear-ligulate, twisted, much spreading, 2 in. long. Corona-processes acute, longer than the staminal-column, each with a short ascending tooth on the back. Style-apex lanceolate-conical, acuminate, with a flattened ring at its base. Follicles linear-acuminate, recurved at tip, 4 in. long, 3 in. broad, recurved to nearly 3 right angles apart; pericarp smooth, thin. Seeds oblong, flattened, 5 to 6 in. long, 15 in. broad, shortly beaked and then broadening at the base of the soft white silky coma which is 1.5 in. long; testa thin, dark brown.

Kedah: Langkawi Island, *Curtis* 3787. Perak: in dense jungle at 2000 to 3000 ft., *King's Collector* 8150.

3. Toxocarpus Scortechinii, King & Gamble, n. sp. A climbing

shrub; branchlets brown, striate, with purplish-brown rather stiff pubescence. Leaves coriaceous when old, almost membranous when young; ovate-oblong or ovate, acuminate at apex, acute at base; both surfaces olive-green when dry, rather dull, lower paler, glabrous except on the midrib beneath; margins recurved; 3 to 4 in. long, 1 to 1.75 in. broad; midrib prominent on the lower, impressed on the upper, surface; main nerves 7 to 8 pairs, pale, raised on the lower surface, starting at an angle of 50° with the midrib and curving upwards to meet in a looped intramarginal nerve; secondary nerves few; reticulations irregular, prominent on the lower surface; petiole 3 to 5 in. long, rustypubescent. Cymes axillary, sessile, densely clothed as in the calvx with purplish-brown pubescence, reaching 75 to 1 in. long; branches few, few-flowered; bracts minute, deciduous; pedicels about 1 in. long, thick; buds oblong; flowers rather large. Calyx-lobes ovate-oblong, glabrous within, 1 in. long; scales 0 or minute, alternate with the lobes within. Corolla-tube short, 1 to 2 in. long; lobes obovate-oblong, glabrous, 35 to 5 in. long, spreading in flower. Corona-processes flat, truncate, much shorter than the anthers when young, when older furnished with an erose tip as long as the anthers, minutely gland-dotted. Style-apex pyriform-clavate, 1 in. long; the tip conical, bifid, in acuminate lobes. Follicles 3 in. long, 4 to 5 in. broad, cylindric, acute; pericarp smooth, thick, brown. Seeds ovate, flattened, with a shining margin, 6 in. long, 25 in. broad; testa brown, thin.

PERAK: Scortechini 630; at Larút Hill, 3000 ft., Derry (Curtis 2706).

The leaves in the two specimens seem at first to differ considerably, but the flowers agree and we believe the difference is merely due to Scortechini's leaves coming from a much older plant.

4. Toxocarpus penangianus, King & Gamble, n. sp. A slender twining shrub; branchlets pale brown, striate, hispid with ferruginous-brown hairs. Leaves chartaceous; lanceolate or oblanceolate, cuspidately acuminate at apex, acuminately cuneate at base; nearly black, shining and glabrous except on the midrib on the upper surface, pale and glabrous on the lower, except on the midrib or main nerves; margins recurved; 3.5 to 4.5 in. long, 1 to 1.25 in. broad; midrib stout, impressed above, raised beneath; main nerves 6 to 8 pairs, irregular but usually at an angle of about 50° with the midrib, slightly curved to meet an intramarginal looped nerve; secondary nerves few; reticulations irregular, prominently netted on the under surface; petiole .25 to .35 in. long, bordered by the narrow decurrent margin of the blade, densely rusty-pubescent. Cymes slender, rusty-pubescent, divaricate, reaching 2 in. in length and about 4 in. in breadth, sessile or very shortly

pedunculate; branches usually dichotomous, slender, bearing clusters of flowers at rather long intervals; bracts minute, subulate; pedicels 0 to 1 in. long; buds conical; flowers reddish-brown. Calyx hispidly rusty-pubescent; lobes ovate-acute or rounded, 05 in. long, gland-dotted. Corolla campanulate; tube as long as lobes; lobes ovate, margins incurved, 1 in. long, shortly villous within. Corona-processes very small, as long as anthers, bifid at apex. Style-apex columnar, clavate when young. Fruit not known.

Penang: at Moniot's road, Curtis 2303.

5. Toxocarpus lankawiensis, King & Gamble, n. sp. A slender twining shrub; branchlets thin with brown bark. Leaves chartaceous: elliptic, shortly cuspidate-acuminate at apex, rounded at base; both surfaces greyish-green when dry, glabrous except along the midrib beneath; margins slightly recurved; 3 to 3.5 in. long, 1.75 to 2 in. broad; midrib slender, impressed above, raised beneath as are the 5 to 6 pairs of main nerves which start at an angle of 60° with the midrib and curve upwards to join in a looped intramarginal nerve; secondary nerves few; reticulations irregular; petiole slender, 25 to 3 in. long, hispid. Cymes axillary, sessile, pubescent, 5 to 1 in. long, corymbose; the flowers racemosely clustered on the branches; bracts persistent, minute. ovate-acute; bracteoles similar, in sheathing pairs to each very short pedicel; buds conical, about 15 in. long; flowers vellowish with purple glandular dots. Calux-tube short, 05 in long; lobes ovate-oblong, acute. ciliate, 1 in. long; scales 0. Corolla campanulate; tube 1 to 15 in. long; lobes triangular-acuminate, blunt, irregular, 05 to 1 in. long, pubescent within, both with glandular purple dots. Corona-processes adherent to the anthers and longer than them, each incurved over the style-apex and with an upturned lobe on the back. Style-apex columnar, on a broad annulate base. Fruit not known.

KEDAH: Langkawi Island, Curtis 2616.

11. Goniostemma, Wight.

Slender climbing shrubs with warted bark. Leaves opposite. Flowers in interpetiolar, lax, many-flowered, paniculate cymes. Calyx 5-partite; lobes rounded, with 5 glandular scales at the base within. Corolla campanulate-rotate; tube lined by a toothed membrane; lobes overlapping to the left. Corona short, thick; the 5 processes combined in a 5-lobed tube adherent to the base of the staminal-column; the lobes triangular, shorter than the column. Staminal-column attached to the base of the corolla-tube, fleshy, much shorter than the style; anthers slender; appendages erect around the style-apex; pollen-masses

single or in pairs in each cell attached to minute pollen-carriers without caudicles. Ovary of 2 carpels; style-apex 5-angled below, produced above in a long fusiform tip. Fruit of 2 follicular mericarps; follicles nearly parallel, thick, lanceolate. Seeds large, flattened, broadly winged; cotyledons elliptic, nerved; radicle cylindric.—Distrib. One species.

GONIOSTEMMA ACUMINATUM, Wight Contrib. 62 (1834). A slender climbing shrub; stem glabrous, pustular; branchlets with smooth brown bark. Leaves somewhat fleshy when green, chartaceous and wrinkled when dry; ovate-oblong, acuminate at apex, cuneate to almost rounded at base; dark green, when dry dark olive-green on the upper and pale brown on the lower surface; margins recurved; 3 to 5 in. long, 1 to 1.75 in. broad; midrib broad, conspicuous and usually pale on the upper, obscure on the lower surface; main nerves very obscure, about 10 to 14 pairs, at about 70° with the midrib, straight to join an obscure intramarginal nerve; secondary nerves many, irregular; reticulations indistinct; petiole slender, .75 to 1.25 in. long, channelled above. Cymes axillary or terminal, paniculately corymbose, reaching 6 to 7 in. in length and 5 to 6 in. in breadth, 2-to 3-chotomous; main peduncles slender, 1.5 to 3 in. long or sometimes 0; primary branches 1 to 2 in. long, remainder smaller by degrees; pedicels slender, 2 in. long; bracts minute, acute; flower-buds oblong, 2 to 3 in. long; flowers cream-coloured. Calyx-lobes orbicular, 05 in. long, ciliate on the margins, gland-dotted near the base, usually with 5 minute scales within, alternate with them. Corolla-lobes oblong-acute, glabrous, ·15 in. long; tube ·1 in. long, lined within by a membrane which ends in 5 triangular acute ciliate teeth. Style-apex fusiform, 1 in. long. Follicles thick, recurved so as to lie nearly parallel and nearly meet at the tips, which are slightly hooked; 4 to 6 in. long, '75 in. broad; pericarp smooth. Seeds many, flat, ovate, '75 in. long, '25 in. broad, ending in a broad flat beak, surmounted by a 2 in. long white silky coma; margins winged; testa thin, brown; albumen scanty; cotyledons oblong, 3-nerved, 2 in. long, 1 in. broad; radicle cylindric, 15 in. long. Wall. Cat. 8242; Done. in DC. Prodr. VIII. 504. Toxocarpus acuminatus, Benth. in Gen. Pl. II. 747; Hook. f. Fl. Br. Ind. IV. 15.

Penang: on Government Hill, 1000 to 1200 ft., Curtis 244; Hullett 182. Perak: at Thaipeng and Sungie Larút, Wray 2369, 2868, 3046; clinging to trees in dense forest near Larút, King's Collector (Kunstler) 2520, 6546, 6686, 10490.—Distrib. India (Sylhet, Wallich 8242).

12. GENIANTHUS, Hook. f.

Twining shrubs. Leaves opposite. Flowers small, in clusters in axillary, subsimple or dichotomously branched, often racemose or spicate cymes. Calyx very small, 5-fid; scales 5, between the bases of the lobes within. Corolla rotate; tube short; lobes narrow, spreading or recurved, villous on the inner face, valvate. Corona of 5 often lobed processes adnate to the back of the staminal-column and often longer than it. Staminal-column short; anthers erect; appendages short, around the style-apex and shorter than it; pollen-masses 2 in each cell, rounded, granular, on a small curved pollen-carrier without caudicles. Ovary of 2 carpels; style thick; style-apex 5-angled below, tip capitate or long and slender. Fruit of 2 divaricate, thickened, usually obtuse, follicular mericarps; testa thickened, often tomentose. Seeds large, flattened, winged, with a long silky coma; cotyledons small; radicle cylindric.—Distrib. About 6 species, of India and Malaya.

1. Genianthus Maingayi, Hook. f. in Fl. Br. Ind. IV. 16 (1883). A slender climbing shrub; branchlets brown, terete, the uppermost purplish-pubescent; nodes swollen. Leaves coriaceous; obovate or oblanceolate, shortly acuminate at apex, cuneate at base, greyish-green when dry, the lower surface somewhat paler than the upper, both slightly pubescent when young; margins strongly recurved; 2.5 to 3.5 in. long, 1.25 to 1.5 in. broad; midrib prominent, with a gland at the base, raised on the lower, impressed on the upper surface, as are the 6 to 7 pairs of main nerves which curve upwards to join a looped intramarginal nerve; secondary nerves few; reticulations few, irregular, rather broad; petiole 25 to 5 in. long, twisted. Cymes in pairs from the leaf-axils, up to 4 in. long, bearing clusters of sessile flowers racemosely arranged; rachis angular, purplish-pubescent; bracts minute, ovate-acute; buds clavate; flowers white with a reddish tinge. Calyx purplish-pubescent without; lobes oblong, obtuse, 05 in. long, with minute scales alternate with them at the base within. Corollatube short, ·025 in. long; lobes linear-oblong, obtuse, recurved in flower, covered within with yellowish villous hairs. *Corona*-processes 2-lobed, dark, longer than the staminal-column. *Style-apex* clavate, acute, ·05 in. long. *Fruit* not known.

Perak: on trees in dense jungle near Larút, King's Collector 5119. Singapore: Maingay (K.D.) 1106.

2. Genianthus Ridleyi, King & Gamble, n. sp. A slender twining shrub; branchlets striate, with scattered round tubercles and covered with thick ferruginous pubescence. Leaves fleshy when fresh, chartaceous when dry; ovate-oblong or -lanceolate, acuminate at apex, rounded at base; dark olive-brown, dull and glabrous on the upper surface, pale and mottled and glabrous on the lower except along the midrib; margins recurved; 3 to 5 in. long, 1 to 2 in. broad; midrib slender, pale, raised on the lower surface, a cluster of small glands at the base; main nerves 6 to 8 pairs, pale, starting at an angle of about 70° with the midrib and curved upwards to meet in loops near the margin; secondary nerves irregular; reticulations obscure, chiefly transverse; petiole rusty-pubescent, twisted, 5 to 75 in. long. Cymes slender, divaricate, rusty-pubescent, racemosely paniculate, reaching 6 in. in length and 8 in. in breadth; peduncles none or short (up to ·5 in. long); branches slender, the flowers in distinct clusters of about 3 to 5; bracts very small, ovate, deciduous; pedicels slender, up to about 15 in. long; buds ovoid. Calyx-tube short; lobes ovate-oblong, rounded, 05 in. long, glabrous within, densely ferruginous-villous without. Corolla-lobes free almost to the base, oblong, bluntly apiculate, recurved in flower, 15 in. long, covered in the upper half within with a dense white beard. Corona-processes acuminate, longer than the anthers. Pollen-carrier gland rounded, bifid; pollen-masses obscurely in fours. Style-apex columnar, 075 in. long. Fruit not known.

Perak: on Maxwell's Hill, Ridley 2988; Scortechini 1172; at Larit, 3000 to 3500 ft., King's Collector 2612.

3. Genianthus rufo-velutinus, King & Gamble, n. sp. A climbing shrub; branches and branchlets stout, densely clothed with soft chocolate-brown tomentum; nodes somewhat swollen. Leaves coriaceous; elliptic-ovate or -obovate, acuminate at apex, cuneate or attenuate or rounded at base; upper surface shining, glabrous or slightly villous, pubescent on the midrib and main nerves; lower surface ferruginous-villous, especially on the nerves, dull; margins strongly recurved; 4 to 6 in. long, 2 to 3 in. broad; midrib stout, impressed above, as are the 7 to 9 pairs of main nerves which, leaving the midrib at an angle of about 50°, are at first straight and then curve upwards to join a rather obscure intramarginal looped nerve, also impressed; secondary nerves

few: reticulations transverse, irregular; petiole stout, .75 to 1 in. long, densely ferruginous-tomentose. Cymes densely ferruginous-tomentose. few-branched, on .25 to .5 in. long peduncles, reaching 4 in. long and broad; branches spicate-paniculate; the flowers in small clusters, sessile or very shortly peduncled; bracts minute, ovate-acute, deciduous; buds oblong-conical; flowers cream-coloured. Calyx campanulate; tube short, ·025 in. long; lobes ovate, glabrous within, as long as tube; scales between them within 0 or very minute. Corolla-tube short, 05 in. long: lobes linear-oblong, 1 in. long, densely white-villous within. Corona adherent to the staminal-column below, free above and longer, each process furnished with an upturned tooth on the back. Stamens slender, appendages acute; pollen-carriers semicircular; pollen-masses 2 to each cell, rounded. Style-apex columnar, ringed at the base. Follicles divaricate in one straight line, cylindric, very obtuse, 4 in. long, about 1 in. broad; pericarp densely covered with chocolate-brown soft wool. Seeds oblong, slightly winged, .75 in. long, .25 in. broad, produced above in a short beak broad at the tip which bears a copious whitish silky coma 2 in. long; testa thin; albumen scanty; cotyledons (immature) oblong; radicle stout.

PERAK: on large trees in dense forest, King's Collector 5611, 6865, 6882.

4. Genianthus Blumei, King & Gamble. A climbing shrub; branches stout, the size of a swan's quill, brown, rugose, lenticellate; branchlets ferruginous-tomentose. Leaves elliptic-ovate or -obovate, shortly acuminate at apex, attenuate when young, rounded when old at base; upper surface glabrous except on the midrib, puncticulate, lower surface densely ferruginous-tomentose when young, less so when old; margins recurved; 3 to 6 in. long, 2 to 4 in. broad; midrib stout, impressed above, much raised beneath, sometimes with small glands at the base; main nerves 7 to 10 pairs, strong, lower ones nearly at right angles to the midrib, upper at about 60°, at first straight, then curved to and along the margin, impressed above; secondary nerves none; reticulations netted, obscure; petiole 5 to 75 in. long, twisted at base, tomentose. Cymes subsessile, lateral, up to 3 in. long; branches divaricate, bearing sessile clusters of densely tomentose small flowers; buds ovoid. Calyx-lobes ovate, acute, densely ferruginous-pubescent without. Corolla-lobes very short, white-villous within. Corona-processes ending in a linear-truncate ligule. Style-apex elongate-apiculate. Follicles 2, divaricate in a straight line, cylindric, obtuse; tip slightly recurved; 3 to 4 in. long, '75 in. broad; pericarp very thick, smooth, glabrous. Seeds ovate, ·6 in. long, ·3 in. broad; margin winged; tip truncate, bearing a 2 in. long pale brown silky coma; cotyledons cordate, 25 in. long; radicle cylindric, 15 in. long. Toxocarpus Blumei, Dene. in DC. Prodr. VIII.

506; Miq. Fl. Ind. Bat. II. 475. Secamone macrophylla β. fulva, Bl. Bijdr. 1050; Hassk. Cat. Bog. 125.

Perak: at Sungie Larút, Wray 2287; Scortechini.—Distrib. Java.

There is some doubt about this species, due to the only specimen of the Java plant available being very imperfect, while both Wray's and Scortechini's specimens are in fruit only.

Tribe III. CYNANCHEÆ.

Filaments of the stamens connate in a column if present; anthers adnate to the upper part of the style, with membranous appendages. Pollen-contents of each anther-cell united in a waxy mass; the pollen-masses opaque, attached in pairs to the pollen-carriers by short or long caudicles from which they are pendulous in the anther-cells. Pollen-carriers turgid, rarely flattened, with a dorsal suture, hard and horny, reddish-brown to black, attached at the angles of the style-apex.

Corona of 5 processes adnate to the anther-column:— Stem erect:—

Corona-processes laterally compressed, circinately curved

at base 13. CALOTROPIS.

Corona-processes cucullate with an interior horn .. 14. ASCLEPIAS.

Stem twining:-

Flowers large, fleshy; corona-processes ·5 in. long, adnate

Flowers small, thin; corona-processes about 1 in. long,

attached to the base of the column.. .. 16. ISCHNOSTEMMA.

Corona annular, adnate to the base of the column and surrounding it

.. 17. Cynanchum.

13. CALOTROPIS, Br.

Erect large shrubs or small trees. Leaves opposite, broad, subsessile. Flowers medium-sized, in umbellate or subracemose pedunculate cymes, arising laterally from the stem between the bases of the leaves. Calyx 5-lobed; the lobes with small glandular scales at the base within. Corolla broadly campanulate or subrotate, divided more than half-way down in 5 broad valvate lobes which are usually reflexed in flower. Corona of 5 laterally compressed fleshy processes, adnate to and standing out as buttresses from the staminal-column, furnished at the base with an upcurved and involute spur, bifid at the apex or with two obtuse auricles. Stamens inserted at the base of the corolla; the anthers short, broad, somewhat horny at the angled wings; appendages short, broad, slightly lobed, membranous, inflexed over the style-apex; anther-cells a shallow membranous pouch; pollen-masses solitary, pendulous, flattened, spathulate, attached by slender jointed caudicles to the oblong, somewhat quadrate, pollen-carrier. Ovary of 2 distinct cells,

joined in a slender style bearing a depressed pentagonal style-apex. Fruit of 2 large, inflated, fleshy, thick, follicular mericarps. Seeds ovate, plano-convex, with broad apex surmounted by a coma of long slender silky hairs.—Distrib. Species 4, of Tropical Asia: in India, China, and the Malay Archipelago, one extending into Africa.

CALOTROPIS GIGANTEA, Br. in Ait. Hort. Kew, ed. 2, ii. 78 (1811). A large shrub, sometimes almost a small tree; branches stout, fleshy, with ash-coloured bark; branchlets covered with soft white woolly tomentum. Leaves somewhat leathery when green, membranous when dry; elliptic-oblong or obovate-oblong, acute at apex, cordate at base; both surfaces when young covered with very short white cottony tomentum, when old the upper glabrous, the lower glabrescent; 4 to 8 in. long, 2 to 4 in. broad; midrib broad, with a large gland at the base on the upper surface; main nerves 6 to 8 pairs, the lowest curved downwards, the rest upwards to and along the margin; reticulations few, not prominent; petiole none or extremely short. Cymes densely whitetomentose, on peduncles 1.5 to 4.5 in. long; branches none or few, 1 to 1.5 in. long, bearing umbels of 6 to 12 flowers on thick pedicels reachantin to 1.25 in. long; bracts linear-oblong, deciduous; buds ovoid. eachuse; flowers greyish-white with rose or lilac markings, 1 to 1.5 in. Calyx-lobes ovate-acuminate, about 15 in. long, cottony without; glands usually about 3. Corolla-lobes ovate-lanceolate, acute, reflexed in flower, 25 to 5 in. long. Corona-processes 25 to 35 in. long. with obtuse auricles on either side near the apex and much incurved spur at the base; the keel puberulous. Anther-appendages 2- to 3-lobed. short, curved over the style-apex. Ovary and style 35 in. long, slender; style-apex star-shaped, flat, 15 in. broad, the umbo depressed, the horns of the star bearing the pollen-carriers. Follicles 3.5 to 5 in. long. oblong, broad, thick, fleshy, ventricose, pale vellow or green when fresh. recurved. Seeds numerous, 25 to 3 in. long by 2 in. broad, broadly ovate, flattened; testa brown, narrowly margined, minutely tomentose; coma 1 to 1.25 in. long; cotyledons ovate-cordate, 125 in. long; radicle ·05 in. long, ovate, acute. Hamilt. in Trans. Linn. Soc. XIV. 245; Wight Contrib. 53, and Ill. t. 155, 156A; Dalz. & Gibs. Bomb. Fl. 149; Brandis For. Fl. 331; Griff. Notul. IV. 68, and Ic. Pl. Asiat. t. 397, 398; Dene. in DC. Prodr. VIII. 535; Bot. Reg. t. 58; Miq. Fl. Ind. Bat. II. 481; Hook. f. Fl. Br. Ind. IV. 17; Bot. Mag. t. 6862; Kurz For. Fl. II. 200; Trimen Fl. Ceyl. III. 148; Cooke Fl. Bomb. II. 151; Prain Beng. Plants 688; Watt in Kew Bull. 1900, p. 8. Asclepias gigantea, Willd. Sp. Pl. 1264; Roxb. Hort. Beng. 20, and Fl. Ind. II. 30. "Ericu" and "Bel-ericu," Rheede Hort. Mal. II. 52, 56, t. 31.

PENANG: Haji Husain for Curtis. PERAK: Wray 2123 (introd.);

Scortechini. Malacca: Maingay (K.D.) 1107. SINGAPORE: Cuming 2408.—DISTRIB. India, Burma, Ceylon, Malay Islands, S. China.

14. ASCLEPIAS, Linn.

Perennial herbs or shrubs, often with tuberous roots, juice milky, stems usually erect. Leaves opposite or whorled. Flowers in pedunculate or sessile umbels, terminal or lateral between the leaves, usually orange-yellow, red or green. Calyx deeply 5-partite, with 5 to 10 glandular scales within at the base. Corolla rotate, deeply 5-lobed; the lobes valvate or slightly overlapping in bud, lobes usually reflexed when open. Corona of 5 processes arising from the staminal-column and adnate to it above; lobes erect, concave-cucullate, with usually a tooth-horn protruding from within. Stamens affixed to the base of the corolla; the filaments connate in a tube; anthers with a membranous appendage inflexed over the style-apex; pollen-masses pendulous, flattened, solitary in each anther-cell, attached to the hard pollen-carriers by caudicles. Styles free below, connected above; style-apex columnar, truncate or depressed and often umbonate at tip. Follicles variable smooth or softly echinate. Seeds comose.—Distrib. Sperit. chiefly of Africa and America, 2 only in Arabia and the naturalized in most warm regions.

ASCLEPIAS CURASSAVICA, Linn. Sp. Pl. I. 215 (1753). A perennial erect herb; stems 2 to 3 ft. high, pale, glabrous, smooth. Leaves lanceolate, acuminate at apex, cuneately acuminate at base, glabrous on both surfaces; 2.5 to 5.5 in. long, .5 to 1 in. broad; midrib slender, raised beneath; main nerves 12 to 15 pairs, irregular, curving upwards at an acute angle; reticulations not very prominent; petiole 25 to 5 in. long. Umbels lateral and terminal, 6- to 12-flowered; peduncles 1 to 3 in. long, puberulous; pedicels 5 to 75 in. long, puberulous; buds ovoid; flowers orange-scarlet. Calyx-lobes lanceolate, acute, 15 in. long, puberulous; scales minute. Corolla reflexed when open; lobes oblong, acute, 2 to ·25 in. long, glabrous, slightly overlapping to the right in bud. Coronaprocesses arising about '1 in. above the base of the staminal-column, spathulate-cucullate, 1 to 15 in. long with a protruding horn as long as themselves arising from the base within and curved inwards over the staminal-column. Anthers auricled at base; appendages orbicular, inflexed over the style-apex. Style-apex columnar, depressed, 5-angled. Follicles lanceolate-acuminate, 3 to 3.5 in. long; pericarp thin, smooth, glabrous. Seeds elliptic, plano-convex, 2 in. long, 15 in. broad, with a broad, thin margin; testa dark brown, thin, lineate; coma '75 to 1 in. long; cotyledons ovate, small; radicle cylindric,

nearly as long as cotyledons. Roxb. Hort. Beng. 20; Lodd. Bot. Cab. t. 349; Bot. Reg. I. t. 81; Done. in DC. Prodr. VIII. 566; Dalz. and Gibs. Bomb. Fl. Suppl. 54; Miq. Fl. Ind. Bat. II. 485; Baill. Hist. des Pl. X. 221, figs. 157-165; Hook. f. Fl. Br. Ind. IV. 18; N. E. Brown in Dyer Fl. Trop. Afr. IV. i. 328; Cooke Fl. Bomb. II. 180; Prain Beng. Plants 689.

Perak: Scortechini. Johore: Curtis. Singapore: Hullett 85. An introduced plant, now naturalized in Africa, India and Malaya, chiefly in waste places near villages.—Distrib. Tropical America, where native.

15. Rhaphistemma, Wall.

Climbing glabrous shrubs with milky juice. Leaves opposite, membranous. Flowers in axillary long-peduncled umbelliform or subracemose cymes, large, white, long-pedicelled. Calyx deeply 5-fid or 5-partite, 5-glandular within at base. Corolla campanulate, 5-lobed; lobes spreading, twisted in bud, overlapping to the right; tube broad. Corona-processes 5, membranous, subulate-acuminate, adnate to the staminal-column and produced above it to twice its length. Stamens affixed to the base of the corolla; filaments connate in a short tube; anthors with an inflexed membranous appendage; pollen-masses one in blong, not compressed, pendulous, waxy, attached to the thick hollow hollow and pollen-carrier by short clayate caudicles. Ovary of 2 carpels; style distinct to near the top; style-apex large, fleshy, 5-lobed, convex at tip. Fruit of (by abortion) 1 thick, fleshy, smooth, subventricose follicle. Seeds plano-convex, margined, comose.—Distrib. Two species; one of India and Burma and the Malay Peninsula, the other of Java.

RHAPHISTEMMA PULCHELLUM, Wall. Pl. As. Rar. II. 50, t. 163 (1831) and Cat. 8221A. A glabrous climbing shrub; branches greyish-brown when dry, terete, much twisted; the nodes with a line of small glands between the leaf-petioles. Leaves membranous; ovate-acuminate at apex, cordate at base, with wide sinus often '75 to 1 in. deep; lower surface pale when dry; 3 to 7 in. long, 2·5 to 4·5 in. broad; midrib prominent, bearing at its base a cluster of subulate small fleshy glands; main nerves 6 to 8 pairs, the lowest 2 to 3 pairs radiating from opposite the gland-cluster, the rest curving upwards and anastomosing near the margin, raised beneath; reticulations few, conspicuous, transverse; petiole 2 to 5 in. long, sulcate above. Cymes 4- to 6-flowered; peduncle 1·5 to 5 in. long; branches few; pedicels slender, '5 to 2 in. long; bracts short, lanceolate, deciduous; buds oblong, '5 to 1 in. long; flowers white, thick. Calyx-lobes ovate-oblong, variable in size, usually '15 to '2 in. long; glands minute. Corolla-lobes oblong, obtuse, reflexed in

flower, '5 in. long; tube longer. Corona-processes subulate-acuminate, membranous, '5 in. long, '1 in. broad. Anthers horny, yellowish, smooth, sagittate at base; appendages rounded, membranous, incurved over the stigma. Style-apex 5-lobed; the lobes horned; tip umbonate, minutely pitted. Follicles solitary, fusiform, turgid, somewhat saccate at base, the apex obtuse with a short hook; pericarp leathery, smooth. Seeds plano-convex with a broad margin, ovate, '4 in. long, with a broad apex bearing a silky coma 1 to 2 in. long; testa brown, thin; cotyledons ovate, cordate, '125 in. long; radicle cylindric, '75 in. long. Wight Contrib. 55; Dene. in DC. Prodr. VIII. 516; Paxt. Fl. Gard. III. t. 101; Paxt. Mag. XIV. 27, with fig.; Fl. des Serres t. 223; Miq. Fl. Ind. Bat. II. 477; Hook. f. Fl. Br. Ind. IV. 19; Prain Beng. Plants 691. Asclepias pulchella, Roxb. Hort. Beng. 21, Fl. Ind. II. 54.

Kedah: Coah, Lankawi Island, Curtis 2118. Penang: Curtis (cult.). Perak: in bamboo jungle at about 400 to 600 ft. Ulu Bubong, King's Collector 10483. Singapore: Deschamps (cult.); G. King (cult.).—Distrib. India (Sikkim, Chota Nagpur, Sylhet, Assam and Cacher), Burma.

16. ISCHNOSTEMMA, King & Gamble, nov. gen.

Twining slender undershrubs. Leaves opposite. Flowers in slender few-flowered, lateral, pedunculate umbels; pedicels filiform. Calyx 5-fid; lobes acuminate. Corolla rotate; tube short; lobes long, slender, overlapping to the right, twisted to the left in bud. Corona of 5 membranous lanceolate flattened processes attached to the base of the staminal-column. Staminal-column attached to the base of the corollatube; anthers slender; appendages short, membranous, obtuse, connivent over the style-apex; pollen-masses 1 in each cell, pendulous, ellipsoid, attached by slender clavate descending caudicles to the crustaceous pollen-carriers. Ovary of 2 carpels; style connate above; style-apex 5-angled; tip rounded. Fruit of 1 (or 2?) long-acuminate slender, follicular mericarps; testa thin, smooth. Seeds small, flat, winged, nearly orbicular, comose; albumen scanty; cotyledons small, ovate; radicle cylindric.—Distrib. One species; Malay Peninsula and Philippine Islands.

Ischnostemma selangorica, King & Gamble, n. sp. A slender twining greyish undershrub; branchlets slender, terete. Leaves membranous, variable; ovate-lanceolate obovate or oblanceolate, mucronate at apex, attenuate at base; glabrous and pale green on both surfaces; 1 to 1.75 in. long, .5 to .75 in. broad; midrib broad, flattened; main nerves 4 to 6 pairs, very faint, curving upwards to meet in a faint intramarginal nerve; reticulations obscure; petiole slender, .25 to .5 in. long.

Umbels usually 3- to 5-flowered; peduncles '75 in. long; bracts minute, subulate; pedicels filiform, '5 to '75 in. long; buds conical; flower yellow. Calyx cleft to the base; lobes lanceolate, acuminate, '1in. long. Corolla-tube very short; lobes lanceolate, acuminate, '2 in.long. Corona-processes acuminate, erect, longer than the column. Style-apex hemispheric at tip. Follicles lanceolate, long-acuminate, 2.5 in. long, '25 in. broad; testa thin, smooth. Seeds flattened, nearly orbicular, '175 in. long, '1 in. broad, broadly winged; testa brown, thin, slightly granular; embryo very small, '03 in. long in all.

SELANGOR: at Kwala Selangor, in mangrove swamps, *Ridley* 7564.— DISTRIB. Philippine Islands, in Central Luzon (*Loher* 4039, 4040).

17. CYNANCHUM, Linn.

Herbs or shrubs, erect or twining. Leaves opposite. small, in sessile or pedunculate corymbose or umbellate cymes or racemes, subaxillary or lateral between the bases of the petioles. Calux 5-partite, with 5 to 10 glandular scales within or eglandular. Corolla deeply 5-fid, rotate or campanulate; lobes slightly overlapping to the right in bud, more or less twisted. Corona arising from the staminalcolumn at or near the base, often membranous, annular, cupular or tubular, toothed or lobed at the top or divided more or less deeply into 5 entire or toothed processes. Staminal-column arising at or near the base of the corolla; filament part varying from none to rather long and slender; anthers hardened; appendages membranous, erect or inflexed over the style-apex; pollen-masses 1 in each cell, oblong, not compressed, pendulous, attached by a caudicle to the rather large horny pollen-carriers. Ovary of 2 carpels; styles free below; style-apex 5-lobed, truncate, conical or rostrate. Fruit of 2 smooth follicular mericarps, winged or entire, sometimes with tubercular processes. Seeds plano-convex, tipped with a silky coma.—DISTRIB. Cosmopolitan, species about 100.

Leaves ovate or oblong, not cordate at base; peduncles short; follicles smooth 1. C. ovalifolium.

Leaves ovate, deeply cordate at base; peduncles long; follicles with soft hooked spines 2. C. corymbosum.

1. Cynanchum ovalifolium, Wight Contrib. 57 (1834). A nearly glabrous, small twining shrub; branchlets very slender, terete, pale brown. Leaves membranous; ovate or oblong, acuminate at apex, rounded or subacute at base, often furnished with one or two small axillary, unequal-sided leaflets at the base of the petiole; both surfaces glabrous, lower pale; margins slightly recurved; 3 to 4·5 in. long, 1·25

to 2 in. broad; the axillary leaflets about 5 in. long; midrib rather broad, channelled above; main nerves 7 to 8 pairs, at first straight, then curved upwards to form a looped intramarginal nerve near the edge; secondary nerves few; reticulations few, obscure; petiole .5 to .75 in. long, articulate near the base, the upper side channelled and with a line of hairs, the base enlarged, those of each pair forming a cup round the branchlet. Cymes lateral, between the leaves, about 4-to 8-flowered, racemose; peduncle 5 to 75 in. long; pedicels 1 to 15 in. long, puberulous; bracts small, obtuse; flower-buds spherical. Calyx-lobes ovate, 05 in. long; glandular scales 5, minute, alternate with the lobes. Corolla cleft nearly to the base; lobes concave, obtuse, 15 in. long. Corona membranous, 1 to 15 in. deep, cylindric, divided above into 10 or more irregular teeth. Staminal-column rather long; wings horny, sagittate at base; appendages membranous rounded, crenate, erect or slightly curved over the style-apex; pollen-masses ellipsoid, waxy, attached by clavate caudicles to the rather large black pollen-carriers. Style-apex 5-angled, depressed, with a small rounded tip. Follicles usually 1 only, thickly coriaceous, nearly straight on the dorsal, curved on the ventral edge, 3 to 5 in. long by .75 to 1 in. broad, tip recurvedhooked, base slightly gibbous; pericarp smooth. Seeds nearly orbicular, plano-convex, broadly winged, 3 to 35 in. long, 25 in. broad, ending in a broad tip which bears a white silky coma 1.5 in. long; testa thin, granular and wrinkled, dark brown; cotyledons ovate, obtuse, 1 in. by ·075 in.; radicle cylindric, ·05 in. long. Wall. Cat. 8226; Hook. f. Fl. Br. Ind. IV. 23. Cynoctonum ovalifolium, Dene. in DC. Prodr. VIII. 529; Miq. Fl. Ind. Bat. II. 479.

Penang: Wallich 8226; Curtis 871, 1270. Province Wellesley: on the road to Arakuda, Ridley 7029. Perak: Wray 1763, 2061, 2939; King's Collector, 2575, 8385, 8450; Scortechini 789. Malacca: Maingay (K.D.) 1140. Singapore: Ridley 10160.—Distrib. Java.

2. Cynanchum corymbosum, Wight Contrib. 56 (1834). A slender climbing shrub; stem rather stout; branchlets terete, glabrous, with rather long internodes. Leaves membranous when dry, dull green when fresh; ovate or orbicular, cuspidately acuminate at apex, cordate at base with a sinus 4 in. deep, 5 in. broad; under surface pale, glaucous, upper surface glabrous except the midrib and main nerves; margins slightly recurved, 2 to 6 in. long, 1 to 3 in. broad; midrib slender, raised beneath, furnished at the base with a tuft of minute glands; main nerves 5 to 6 pairs, the lowest 3 pairs spreading from opposite the gland-tuft, the rest curved upwards to near the margin; reticulations rather scanty, chiefly transverse; petiole 1.5 to 3 in. long, slender. Cymes corymbiform, many-flowered, 2 to 3 in. long, glabrous;

peduncle slender, about 1.5 in. long; bracts minute, subulate; pedicels slender, 5 in. long; buds ovoid. Calyx deeply cleft; lobes ovate, acute, hyaline on the margins, 05 in. long; scales obscure. Corolla campanulate; tube very short; lobes erect, oblong, obtuse, 15 in. long; margins usually somewhat reflexed. Corona as long as corolla-lobes, campanulate, irregularly crenately 10- or more lobed with 10 internal longitudinal folds. Staminal-column inserted at the base of the corollatube; anther-wings broad, horny; cells pocket-like; appendages ovateacute; pollen-masses ellipsoid, attached by short clavate caudicles to the small oblong pollen-carriers. Style-apex 5-angled; tip acuminate, bifid. Follicles 1 or 2, reddish, lanceolate, long-acuminate, 3 to 5 in. long, 1 to 1.5 in. broad; pericarp thick, densely clothed with soft reversed-hooked spines 25 to 5 in. long. Seeds orbicular-ovoid, 5 in. long and nearly as broad, wrinkled, broadly winged, deeply dentatecrenate at the lower end; tip truncate, crowned with a 1 to 1.5 in. long white silky coma; testa dark brown, shining, rugose on the dorsal face; cotyledons elliptic, 15 in. long; radicle cylindric, acute, 075 in. long. Wall. Cat. 8222, 8231; Hook. f. Fl. Br. Ind. IV. 24. Cynoctonum corymbosum, Done. in DC. Prodr. VIII. 528.

Penang: Wallich. Perak: on shrubs at 300 to 500 ft., King's Collector 5301; Scortechini.—Distrib. India (Sikkim, Assam, Sylhet, Cachar, Nicobar Islands).

Tribe IV. MARSDENIEÆ.

Stamens with filaments connate into a tube; anthers erect or incumbent on the style-apex and adnate to it at their base, with flat or inflated membranous appendages. Pollen-contents of each anthercell united into a waxy mass; pollen-masses opaque, without a pellucid margin, attached in pairs to the pollen-carriers by long or short caudicles, erect or ascending or horizontal, never entirely pendulous, sometimes very minute and the caudicles very slender; pollen-carriers hard and horny, with a dorsal suture, usually dark-coloured.

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Corona-processes fleshy or membranous, with one or
                                                         .. 22. MARSDENIA.
      sometimes two apical teeth, sometimes none
    Corolla hypocrateriform :-
      Corolla small or moderate-sized; corona-processes com-
                                                         .. 23. PERGULARIA.
      pressed, beaked
                                                         .. 24. STEPHANOTIS.
      Corolla large: corona-processes none or flattened
    Corolla rotate or rotate-campanulate; corona-processes
                                                         .. 25. TYLOPHORA.
    small, on the filament part of the column
Corolla-lobes valvate:-
    Corolla rotate or subcampanulate:-
      Corona-processes spreading, lower lobes usually dentate
      or laciniate, upper lobes tubercular or absent; leaves not
      fleshy; climbing shrubs
                                                         .. 26. HETEROSTEMMA.
      Corona stellate, lower lobes erect or spreading, upper
      beaked: leaves usually fleshy; epiphytes or epiphytic
      climbers ..
                                                         .. 27. Ноча.
                                    . .
    Corolla urceolate or cylindric or campanulate; corona-pro-
                                                         .. 28. DISCHIDIA.
    cesses very membranous; epiphytes
                                              . .
    Corolla-tube short, lobes long subulate; twining under-
    shrub
                                                          .. 29. Pycnorhachis.
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18. SARCOLOBUS, Br.

Twining glabrous shrubs. Leaves opposite. Flowers small, in crowded, pedunculate, axillary or interpetiolar corymbiform cymes. Calyx 5-partite, with 5 minute glandular scales at the base within. Corolla campanulate or subrotate, 5-fid; the lobes overlapping to the right. Corona none. Stamens affixed to the base of the corolla; filaments connate in a short tube; anthers broad, ending in a spathulate inflexed appendage; pollen-masses solitary in each cell, erect, compressed, obovate, attached by long filiform twisted caudicles to the narrow, long, channelled pollen-carriers. Ovary of 2 distinct carpels; styles distinct below, ending above in a 5-angled style-apex with flat or slightly rounded tip. Fruit of usually 1 thick globose and smooth or ovate and 2-keeled follicular mericarp; pericarp fleshy, chartaceous when dry. Seeds large, marginate, without coma.—Distrib. Species 3: two of India, the Malay Peninsula, and the Andaman and Nicobar Islands; the third of Java.

Sarcolobus globosus, Wall. in Asiat. Research. XII. 577, t. 4 (1818), and Cat. 4468. A twining shrub; branchlets slender, smooth, shining, callose-punctate, pale brown. Leaves thinly coriaceous; oblong or ovate-oblong, acute or shortly acuminate at apex, rounded at base and usually somewhat unequal-sided; both surfaces brown when dry, lower glaucous, young leaves slightly puberulous; margins slightly recurved; 3 to 4·5 in. long, 1 to 1·75 in. broad; midrib slender, channelled above and furnished with a small cluster of glands at the base,

raised on the lower surface; main nerves 5 to 7 pairs, broadly arched to meet in a looped intramarginal nerve rather far from the edge; reticulations irregular, chiefly transverse; petiole slender, 5 to 1 in. long, channelled and puberulous on the upper surface. Cumes many-flowered. slightly puberulous; peduncles .5 to .75 in. long, thickened at top below the corymbs; pedicels 25 in. long, slender; bracts small, triangular; buds broadly ovoid. Calyx-lobes scarious, ovate, obtuse, 05 to 1 in. long; scales minute, 5 to 10. Corolla-lobes nearly orbicular, pubescent within, 2 in. long, pale purple. Anthers slightly auricled; appendages much incurved. Style-apex 5-lobed with a rounded tip. Follicle globose, retuse at apex and base, 4 in. in diam.; pericarp very thick, with many raised dots. Seeds broadly obovate, flat with a raised border, apiculate, 7 to 1 in. long; coma none; testa dark brown; cotyledons obovate, retuse at apex; radicle small. Wight Contrib. 47, and Ic. t. 1273; Dene. in DC. Prodr. VIII. 625; Hook. f. Fl. Br. Ind. IV. 27; Prain Beng. Plants 693. S. carinatus, Griff. Notul. IV. 53, and in Ic. Pl. Asiat. t. 410 (not of Wall.).

PERAK: Scortechini 127, 1393; King's Collector 1028, 1162.

MALACCA: Griffith 3773. SINGAPORE: Hullett 32, 648; Ridley 5745.—
DISTRIB. India (Salt Lakes, Calcutta, C. B. Clarke), Burma (Mergui, Griffith), Borneo (Haviland). A plant of the banks of salt river-creeks.

19. Pentasacme, Wall.

Tufted erect glabrous herbs, with slender simple stems and many wiry roots, rooting on rocks. Leaves opposite, membranous, narrow. Flowers yellowish or white, small, in short axillary umbelliform or racemose cymes; pedicels capillary. Calyx 5-partite, with 5 glandular scales within. Corolla-tube short, campanulate; lobes narrow, caudate, twisted, overlapping to the right in bud. Corona-processes 5, on the corolla-tube, entire or toothed. Staminal-column very short; antherappendages membranous; pollen-masses 1 in each cell, erect, ovoid, waxy, attached near the middle by a slender caudicle to an oblong pollencarrier. Ovary of 2 carpels; style short; style-apex 5-angled, conical or beaked at apex. Fruit of 1 slender terete follicle, straight; pericarp thin, smooth. Seeds oblong-spathulate, not or very slightly winged, convex on both surfaces; cotyledons ovate; radicle cylindric.—Distrib. Species 3 or 4: two of India and Malaya, the other Chinese.

Pentasacme caudatum, Wall. Cat. 8234 (1829). A tufted erect glabrous herb; stems simple, many, slender, 12 to 18 in. long, pale brown, terete, 1 in. in diam.; roots many, slender, twisted, spreading. Leaves membranous; linear-lanceolate, long caudate-acuminate at apex, narrowed at base; pale on both surfaces when dry, under surface

glaucous; 2 to 4 in. long, ·2 to ·4 in. broad; midrib slender, prominent; main nerves about 12 pairs, obscure, acutely curving upwards to meet an intramarginal slightly-looped nerve; reticulations hardly visible; petiole none or up to 1 in. long; stem clasping at base. Cymes racemose, 1- to 6-flowered, very short; peduncles very short; pedicels capillary, 2 to 25 in. long; bracts minute; flowers white; buds conical. Calyx-lobes ovate-lanceolate, acuminate, 06 in. long; glands dark. Corolla-lobes caudate-acuminate from a broad base, 25 in. long; tip obtuse. Corona-processes short, obscurely 4-lobed behind; lobes with several short obtuse teeth in front. Follicles 1.75 to 3 in. long, very slender, straight; pericarp thin. Seeds ovate-spathulate, with a minute wing near the base, concave, 15 in. long; tip obliquely truncate with a white silky coma 5 to 75 in. long; testa thin, brown, papillose; cotyledons ovate, 05 in. long; radicle cylindric, 025 in. long. Wight Contrib. 60; Done, in DC, Prodr. VIII. 627; Mig. Fl. Ind. Bat. II. 501; Hook, f. Fl. Br. Ind. IV. 28. Spiladocorys angustifolia, Ridley in Trans. Linn. Soc. Ser. 2, III. 322, t. 63.

PERAK: growing on rocks in the beds of streams; Curtis; Ridley 2885; Scortechini 1310; Wray 1980; King's Collector 10685. Pahang: on Tahan river, Ridley 2589.—Distrib. India (Khasia Hills, Patkoi Hills, and Sylhet), Burma.

20. GYMNEMA, Br.

Twining shrubs or undershrubs. Leaves opposite. Flowers small, in crowded sublateral or opposite umbelliform cymes. Calyx 5-partite, eglandular or with 5 to 10 glandular scales at the base within. Corolla subrotate, campanulate or urceolate, 5-fid; lobes thick, narrowly overlapping to the right in bud or subvalvate. Corona-processes 5, arising from and adnate to the corolla-tube, either of 5 fleshy lobes adnate up to the mouth of the corolla-tube with more or less free incurved points, or of 5 pairs of fleshy ridges on the lower part of the tube, alternating with the corolla-lobes. Staminal-column arising from the base of the corolla; anthers short, erect, with short membranous appendages; pollen-masses erect, attached to the pollen-carriers by very short caudicles. Ovary of 2 carpels; styles free to near the top; style-apex large, conical, clavate or capitate, exserted beyond the anthers. Fruit of 2 (or 1) smooth follicular mericarps. Seeds comose.—Distrib. About 20 species, chiefly Asiatic, two extending to Central Africa, others to Australia.

Corolla-tube short, with corona-processes of 5 fleshy villous lobes on the throat, the free points exserted in the sinuses:—

Leaves 3 to 6 in. long, tawny-pubescent beneath; cymes subcapitate, shortly peduncled ... 1. G. acuminatum.

1. GYMNEMA ACUMINATUM, Wall. Tent. Fl. Nap. 50 (1826); Cat. 8187. A large twining shrub with corky bark; branchlets softly tawny-pubescent. Leaves coriaceous; ovate or ovate-elliptic, acuminate at apex, rounded at base; upper surface glabrous, lower tawny-pubescent; margin slightly recurved; 3 to 6 in. long, 1.75 to 2.25 in. broad; midrib stout; main nerves 4 to 6 pairs, curved upwards to anastomose near the margin; reticulations in a prominent network; petiole 5 in. long. Cymes in pairs, many-flowered, subcapitate, tawny-pubescent; peduncle as long as or shorter than the petiole, pedicels very short. Calyx-lobes ovate-acute, 05 in. long, pubescent without; scales very small. Corolla-lobes rounded, the tips incurved, .075 to .1 in. long, glabrous. Corona of rounded, incurved processes alternate with the corolla-lobes, with bearded short ridges below them half-way down the tube. Anthers short; appendages erect, rounded, membranous; pollen-masses oblong, attached to the pollen-carriers by very short or almost no caudicles. Style-apex fleshy, globose-conical. Follicles 3 in. long, ovoid, turgid, beaked, woody, cordate at base; pericarp glabrous. Seeds large, 7 in. long, flat, elliptic, broadly winged, the wing membranous. Contrib. 45; Done. in DC. Prodr. VIII. 622; Mig. Fl. Ind. Bat. II. 499; Hook. f. Fl. Br. Ind. IV. 30; Prain Beng. Plants 694. Cynanchum acuminatum, Herb. Ham. Asclepias acuminata, Roxb. Hort. Beng. 21, and Fl. Ind. II. 55.

Kedah: Langkawi Island, Curtis 2811. Malacca: Griffith; Maingay (K.D.) 1109.—Distrib. India (Eastern Bengal and Chittagong), Burma, Java.

2. GYMNEMA LACTIFERUM, Br. in Mem. Wern. Soc. Edinb. I. 33 (1808); Wight Contrib. 44; Dene. in DC. Prodr. VIII. 622; Hook. f. Fl. Br. Ind. IV. 30; Trimen Fl. Ceyl. III. 154. G. zeylanicum, Dene. in DC. l. c. Asclepias lactifera, Linn. Sp. Pl. 216.

Var. nitens, Hook. f. Fl. Br. Ind. IV. 31. A twining shrub; branchlets smooth, dark brown, glabrous, the uppermost pubescent. Leaves membranous when dry and reddish brown; ovate-lanceolate, acuminate at apex, acute at base; glabrous on both surfaces or the midrib and nerves beneath pubescent; margins recurved; 2 to 4 in. long, 75 to 1.5 in. broad; midrib slender; main nerves about 6 pairs, curving acutely upwards to an irregular intramarginal nerve, not prominent; reticulations faint; petiole slender, ·3 to ·4 in. long. Cymes in pairs, opposite, alternate with the leaves, minutely pubescent; umbels racemose, with minute persistent bracts 10- to 12-flowered; peduncles ·25 in. long; pedicels slender, ·1 to ·15 in. long; buds ovoid. Calyx-lobes ovate with scarious margins, ·05 in. long; glands 5, subulate, black. Corolla ·075 in. long; lobes as long as tube, rounded. Corona of 5 pairs of bearded ridges on the corolla-tube alternate with the lobes, and with small rounded incurved tips. Anther-appendages rounded, minutely erose; pollen-masses spathulate, connected by short jointed rounded caudicles to the oblong pollen-carriers. Style-apex globose. Fruit not seen. G. nitens, Blume Mus. Bot. I. 149, t. 29; Miq. Fl. Ind. Bat. II. 498. G. Malayanum, Griff. Notul. IV. 56, and Ic. Pl. Asiat. t. 394.

Penang: Curtis. Perak: Scortechini 2007. Malacca: Maingay (K.D.) 1110.—Distrib. Sumatra, Borneo (Motley 383).

3. Gymnema Maingayi, Hook. f. Fl. Br. Ind. IV. 31 (1883). A slender much twining undershrub; branchlets finely tawny-pubescent; the bark papery. Leaves membranous when dry; ovate-acuminate at apex, cordate at base; both surfaces pubescent; the hairs with bulbous bases, vellow when dry; margins slightly recurved; 1 to 2 in. long, 75 to 1 in. broad; midrib prominent, impressed above, sometimes with a small gland at the base; main nerves 4 to 5 pairs arching upwards and anastomosing near the margin; reticulations not easily visible; petiole 125 to ·25 in. long, curved, easily detached at the base. Cymes subsessile, pubescent; the peduncle when present short, thickened; pedicels slender, ·1 to ·2 in. long; bracts most minute; buds oblong-conical. Calyx deeply cleft, pubescent without; lobes oblong, obtuse, 05 in. long; scales invisible. Corolla campanulate; tube 075 in. long; lobes ovate, ·025 in. long, glabrous, thickened. Corona of small fleshy obtuse scales in the sinuses of the corolla-lobes, and a decurrent hairy ridge below extending about half-way down the tube. Staminal-column columnar; anther-wings long; appendages rounded, short, scarious; pollen-masses clavate, connected by very short jointed caudicles to the nearly globose pollen-carriers. Style-apex dome-shaped, much exceeding the anthers. Fruit not known.

Malacca: Maingay (K.D.) 1111.

4. Gymnema tingens, Wight Contrib. 45 (1834). A slender climbing shrub; branchlets dark brown, slender, smooth, somewhat thickened at the nodes. Leaves membranous when dry; ovate-acuminate at apex, rounded shallowly cordate or (when young) slightly cuneate at base; both surfaces glabrous, olive-green when dry; margins slightly recurved; 2.5 to 6 in. long, 1 to 3 in. broad; midrib slender, raised beneath; main nerves 5 to 8 pairs, the lowest 2 to 3 pairs rather close

together and more spreading than the rest; reticulations many, obscure; petiole slender, .75 to 1.5 in. long, channelled above. Cymes as long as or shorter than the petioles, axillary between the leaves, puberulous; peduncles slender, 5 to 75 in. long; branches few, short, much thickened, bracteate, bearing spirally racemose many-flowered umbels; pedicels capillary, 5 in. long; buds conical; flowers pale yellow. Calyx-lobes oblong, 15 to 2 in. long, ciliate; glands 5, very small. Corolla-tube ·1 in. long, pubescent within; lobes ·15 in. long, narrowly oblong, obtuse, glabrous. Corona of thickened hispidly bearded broad ridges inside the corolla-tube a little way below the sinuses of the lobes; no free scales at the sinuses. Staminal-column slender, 15 in. long; appendages ovate, membranous, erect; pollen-masses oblong-clavate, attached to the ovoid pollen-carriers by very short clavate caudicles. Style-apex elongate, clavate, much exceeding the anther-column. Follicles solitary, slender, straight or very slightly curved, 5 to 6 in. long, 4 to 5 in. broad, point acuminate; pericarp smooth, ribbed. Seeds elliptic, flat, ·5 in. long, ·3 in. broad, with a broad wing, base obtuse, apex slightly produced and truncate, surmounted by a white silky coma 1.5 in. long; testa thin, dark brown; cotyledons elliptic, 15 in. long; radicle cylindric, 075 in. long. Wall. Cat. 8190; Hook. f. Fl. Br. Ind. IV. 31; Prain Beng. Plants 694. G. tingens var. cordifolia, Wight Ic. t. 593. Bidaria tingens, Dene. in DC. Prodr. VIII. 623, partly. tingens, Roxb. Hort. Beng. 21, and Fl. Ind. II. 53.

PERAK: at Ulu Bubong, 400 to 600 feet, clinging to large trees, King's Collector 10242; at Chanderiang under 300 feet, ib. 5747.— DISTRIB. India, Burma.

21. Gongronema, Done.

Twining shrubs or undershrubs. Leaves opposite. Flowers small, in sessile or pedunculate or branching cymes, often umbelliform, in one of the axils of a pair of leaves, often with thickened tuberculate bracteate rachises (as in Hoya). Calyx 5-partite, glandular or eglandular within. Corolla urceolate subrotate or broadly campanulate; the lobes narrowly overlapping to the right (valvate in G. Wrayi). Corona-processes 5, adnate to the staminal-column near the base, usually small and rounded, sometimes large, erect. Staminal-column inserted at the base of the corolla, short; anther-appendages membranous, inflexed over the style-apex; pollen-masses solitary in each cell, erect, ovoid, waxy, attached by slender curved caudicles to rather large ellipsoid pollen-carriers. Ovary of 2 carpels; style short; style-apex conical or convex. Fruit of 2 (more usually 1) smooth, acuminate follicular mericarps. Seeds comose.—Distrib. Species about 10; Asiatic, African, and Australian.

Corolla urceolate; cymes shorter than the petioles; corona rounded, more or less adherent to the staminal column:—

Leaves rounded at base; caudicles of pollinia curved, slender Leaves cordate at base; caudicles of pollinia clavate ... corolla campanulate; cymes longer than the petioles; corona

Corolla campanulate; cymes longer than the petioles; corona ligulate, angularly bent upwards; caudicles slender, straight... Corolla campanulate, almost hypocrateriform; cymes shorter than the petioles; corona dorsally flattened below, radically flattened above; caudicles long, much curved ...

1. G. Wallichii.

2. G. Curtisii.

3. G. bracteolatum.

4. G. Wrayi.

1. Gongronema Wallichii, Done. in DC. Prodr. VIII. 624 (1844). A small twining shrub; branchlets slender, pale brown, smooth. Leaves firmly membranous: elliptic-oblong or -lanceolate, shortly acuminate at apex, rounded at base; both surfaces glabrous, the lower paler; margins slightly recurved; 3 to 6 in. long, 1 to 2 in. broad; midrib slender, impressed above, raised beneath, with a small tuft of glands at the base just above the petiole; main nerves 5 to 6 pairs, arched upwards to meet in a prominent intramarginal looped nerve; secondary nerves and reticulations few, irregular; petiole 5 to 75 in. long, slender, twisted. Cumes subsessile, racemiform, few-flowered, shorter than the petioles, on a stout rachis tuberculate with many persistent small rounded imbricate bracts; pedicels slender, 1 to 15 in. long; buds globose. Calyx-lobes ovate-acute, scarious, 05 in. long; scales 5, minute. Corolla urceolate; tube 1 in. long, nearly globose, minutely hairy within; teeth acuminate, erect or spreading, 05 in. long. Coronaprocesses broad, somewhat incurved, rounded at the tip from a broad base, adherent to the base of the staminal-column, fleshy. Staminalcolumn short; appendages membranous, acuminate; pollen-masses oblong-ovoid, attached by slender curved caudicles to the ovoid pollen-Style-apex shortly 5-lobed, with a conical apiculus. Follicles slender, straight or gently curved, linear-lanceolate, acuminate, 6 in. long, 3 to 4 in. broad; pericarp smooth. Seeds ovate, spathulate, flattened, 3 to 35 in. long, twisted, with a broad wing. Mig. Fl. Ind. Bat. II. 500; Hook. f. Fl. Br. Ind. IV. 33. Gymnema Wallichii, Wight Contrib. 46; Wall. Cat. 8195A.

Province Wellesley: Ridley 7029. Malacca: Griffith (K.D.) 3770; Maingay (K.D.) 1113.—Distrib. Borneo (Haviland 3503).

2. Gongronema Curtish, King & Gamble, n. sp. A slender small twining shrub; branchlets pale brown, slender, smooth; innovations tawny-pubescent. Leaves membranous when dry; elliptic-lanceolate or -obovate, broadly acuminate at apex, shortly cordate at base; tawny-pubescent on both surfaces when young, glabrescent when older, except on the margins and midrib, under surface pale grey; 2.5 to 3 in. long, '75 to 1.5 in. broad; midrib broad, prominent beneath, with

a small glandular tuft at the base just above the petiole; main nerves 5 to 6 pairs, very faint, curved upwards to a faint intramarginal nerve; reticulations not distinguishable; petiole slender, 5 to 75 in. long, twisted at base. Cymes shorter than the petioles, pubescent, sessile or very shortly pedunculate, 2-flowered with a thickened bracteate rachis; pedicels slender, 05 to 1 in. long; buds globose-conical; flowers pale Calyx-lobes ovate-acute, pubescent, ciliate, .075 in. long; scales about 10. Corolla urceolate; tube 15 in. long, pubescent within; lobes oblong, acute, spreading, twisted, 1 in. long. Coronaprocesses rounded, curved downwards, attached to the base of the anthers, columnar, fleshy. Anthers short; appendages erect, membranous, triangular-ovate; pollen-masses oblong-ovoid, waxy, attached by slender slightly clavate caudicles to the rather large ovate pollencarriers. Style-apex of a 5-lobed flattened ring, surrounded by a large rounded conical apiculus. Fruit not known.

Penang: on West Hill at 2000 ft., Curtis 1545. Perak: at Lower Camp, Gunong Batu Patch, Wray 1011.

3. GONGRONEMA BRACTEOLATUM, King & Gamble, n. sp. A small twining shrub; branchlets rather stout, brown, uppermost minutely puberulous. Leaves coriaceous; oblong-lanceolate, acuminate at apex, cordate at base; when young puberulous, when old glabrescent, except on the midrib; margins recurved; 3 to 6 in. long, 1.25 to 1.75 in. broad; midrib rather stout, keeled above, furnished with a tuft of small glands at the base just above the petiole; main nerves 6 to 7 pairs, acutely curving upwards to join in a looped intramarginal nerve; reticulations obscure; petiole .75 to 1 in. long, curved. Cymes longer than the petioles, racemose, on .5 to .75 in. long, thickened, many-bracted rachises at the ends of the peduncles; peduncles thick, woody, 5 in. long; pedicels 15 to 2 in. long; bracts ovate-acute; buds conical; flowers yellow. Calyx-lobes ovate-acute, glandular, ciliate, scarious, 05 in. long; scales 10, minute. Corolla campanulate, broad; tube 1 in. long, pubescent within; lobes triangular, ovate-acute, spreading, '15 in. long. Corona-processes attached to the back of the staminal-column at its lower part, thick, fleshy, ligulate, bent in the middle and curving over the top of the staminal-column and style-apex. Anthers with a short, membranous, acuminate, incurved appendage; pollen-masses ovoid, attached by slender straight caudicles to the rather large pollen-carriers. Styleapex annular, obscurely 5-lobed; the apiculus convex. Fruit not known.

PERAK: at Goping, King's Collector 721.

4. Gongronema Wrayi, King & Gamble, n. sp. A slender twining undershrub; branchlets terete, yellowish, very flexuous. *Leaves* coriaceous, bright green, ovate, bluntly acuminate at apex, rounded and

almost cordate at base; both surfaces glabrous, shining; margins recurved; 2.5 to 4 in. long, 1 to 1.75 in. broad; midrib stout, impressed above, raised beneath, with a large gland at its base; main nerves 5 to 7 pairs, at about 70° with the midrib, nearly straight at first, then often branched, joining an irregular looped intramarginal nerve; secondary nerves many, similar, but not meeting the sinuses of the intramarginal nerve; reticulations irregular, usually branched towards the midrib: petiole slender, 5 to 75 in. long. Cymes axillary, umbellate, about 5- to 6-flowered, shorter than the petioles; peduncle thick, about ·1 in. long; bracts triangular, small; pedicels ·1 in. long, puberulous; flower-buds conical; flowers yellow. Calyx cup-shaped, pubescent without; lobes orbicular, ciliate, 075 in. long; scales minute. Corolla thick, campanulate, almost hypocrateriform; tube cylindric, 15 to 2 in. long, glabrous on both surfaces; lobes triangular, valvate, stellately spreading, nearly as long as tube. Corona of 5 erect processes adnate to the backs of the anthers, very fleshy, ovate, glabrous, dorsally flattened and concave below, radially flattened and rounded at apex, much longer than the staminal-column. Staminal-column short; filament-tube nearly free from the corona; anther-cells parallel; appendages scarious, ovate-acute, incurved over the style-apex; pollen-masses ellipsoid, granular, attached by very slender long curving caudicles to the small conical pollen-carriers. Style-apex 5-angled, thick, depressed, with a conical apex. Fruit not known.

PERAK: at Relan Tujor, Wray 2243.

22. Marsdenia, Br.

Climbing, rarely erect, shrubs or undershrubs. Leaves opposite. Flowers small or of moderate size, in umbelliform cymes or in small sessile umbels or clusters scattered along the branches of the cymes or of panicles, which are lateral at the nodes or axillary. Calyx 5-partite, with 5 to many glandular scales at the base within, sometimes eglandular. Corolla campanulate or urceolate; lobes 5, overlapping to the right. Corona-processes 5, membranous or fleshy, arising from the staminal-column, the basal part adnate to it, the apical part free; often of two lobes one above the other. Staminal-column arising from or near to the base of the corolla; anthers erect, with membranous appendages more or less incumbent over the style-apex; pollen-masses erect, solitary in each anther-cell, oblong, waxy, attached in pairs by moderately stout caudicles to the ovate horny pollen-carriers. Ovary of 2 carpels; style short; style-apex large, usually more or less hollowed above and then expanding into a convex or conical or depressed tip. Fruit of 2 (more usually 1 only, by abortion) lanceolate or poniardshaped follicular mericarps; pericarp thick, smooth or wrinkled, or sometimes winged. Seeds comose.—DISTRIB. About 70 species: in the tropics of both hemispheres, one South European.

Plant turning blue in drying; flowers small, in clusters in a thyrsoid panicle; corolla campanulate, lobes short, with tufts of hair at the mouth; corona-processes subulate-acuminate. longer than the anthers Plant brown when dry; flowers in pedunculate corymbose cymes: corolla tubular-campanulate, lobes linear, glabrous: corona-processes 2-lobed, outer flattened, inner acute, shorter than the anthers Plant greenish-brown when dry; flowers in clusters in a long spike or raceme; corolla urceolate, lobes lanceolate; coronaprocesses none or small, and then adnate to the anthers Plant greyish when dry; flowers in pedunculate umbels; corolla rotate, lobes broadly rounded; corona-processes large, round. fleshy, with an acute beak shorter than, or equal to, the anthers

- .. 1. M. tinctoria.
 - 2. M. Scortechinii.
- .. 3. M. thyrsiflora.
 - 4. M. volubilis.

1. Marsdenia tinctoria, Br. in Mem. Wern. Soc. Edinb. I. 30 (1808). A climbing shrub; stem stout, smooth; branchlets slender, smooth. uppermost pubescent, the whole plant when dry having a blueish-black tinge. Leaves membranous when dry; ovate or ovate-oblong, shortly and abruptly acuminate, sometimes long caudate-acuminate at apex, rounded or cordate at base; both surfaces finely pubescent when young. afterwards glabrous; 3 to 9 in. long, 1 to 3 in. broad; midrib slender, usually pubescent, furnished above at the base and partly on the petiole with a group or string of small glands; main nerves 7 to 8 pairs, not conspicuous, straight or slightly curved, usually at about 50° with the midrib; reticulations transverse, slender, obscure; petiole slender, puberulous, 75 to 1.25 and even 2 in. long, twisted and curved in the middle. Cymes in densely flowered interrupted clusters along or on the branches of a thyrsoid panicle reaching 3 to 6 in. in length and 5 to 1 in. in diam., grey-puberulous; peduncles 5 to 1.5 in. long; pedicels slender. 15 in. long; buds ovate; flowers yellow, blue when dry. Calyxlobes ovate, pubescent without, ciliate, 3- to 5-nerved, membranous, ·05 in. long; glandular scales 5, minute. Corolla cylindric-campanulate; tube slightly constricted at mouth, furnished within with 5 lines of retrorse stiff hairs 075 in. long; lobes rounded, erect or spreading in flower, 025 to 05 in. long, each furnished within with a tuft of stiff bristles. Corona-processes membranous; the apex subulate-acuminate, longer than the anthers. Anthers with membranous incurved appendages; pollen-masses oblong, attached by long somewhat clavate. caudicles to the rather small pollen-carrier. Style-apex annular, 5-rayed; the top depressed with a very short umbo. Follicle 1, pendulous; linear-lanceolate, 3 in. long, 5 in. in diam., somewhat gibbous at base, acuminate and slightly hooked at tip; pericarp pubescent. Seeds compressed, ovate, shortly beaked, 5 in. long, 25 in. broad, with a narrow wing. Wight Contrib. 40, and Icones t. 519; Wall. Cat. 8173; Griff. Notul. IV. 52, and Ic. Pl. Asiat. t. 389; Done. in DC. Prodr. VIII. 615; Miq. Fl. Ind. Bat. II. 491; Hook. f. Fl. Br. Ind. IV. 34; Brandis For. Fl. 332; Kurz For. Fl. II. 201; Prain Beng. Plants 696. M. monostachya, Wall. MSS. Asclepias tinctoria, Roxb. Hort. Beng. 20, and Fl. Ind. II. 43. Pergularia tinctoria, Spreng. Syst. I. 844. P. parviflora, Blume Bijdr. 1056. Cynanchum tingens, Hort. Ham.

Kedah: King's Collector 1731. Perak: Ridley 9672 (in very young fruit and in some respects slightly different-looking); Scortechini 1299.—Distrib. India (Sikkim, Assam, and E. Bengal), Burma, Sumatra, Java, Borneo, China.

The description of the fruit requires verification for the Malay Peninsula.

2. Marsdenia Scortechinii, King & Gamble, n. sp. A twining shrub; branchlets very slender, pale brown. Leaves membranous when dry; ovate, long-acuminate at apex, rounded or cordate at base; both surfaces slightly puberulous when young, afterwards glabrous, brown when dry; 2 to 3 in. long, 1 to 1.5 in. broad; midrib slender, with a tuft of small glands at the base above the petiole; main nerves 5 to 7 pairs, curving upwards to anastomose near the margin; reticulations many, transverse and netted; petiole slender, 5 to 1 in. long, twisted. Cymes axillary between the petioles, pedunculate, corymbose, puberulous, about 1 in. long and broad; peduncles 5 in. long; flowers very many; buds conical-acuminate; pedicels 15 in. long; bracts ovate-acuminate. Calyx-lobes oblong, acute, membranous, ciliate, 1 in. long; scales 5, minute. Corolla tubular-campanulate; tube 1 in. long, glabrous within; lobes linear-oblong, 15 in. long, glabrous. Corona-processes membranous, bifid; outer lobe flattened, rounded; inner erect, acute, shorter than the anther-column. Anthers with prominent cells; appendages membranous, acute, erect; pollen-masses large, oblong, attached by rather short caudicles to the rather large ovate, channelled, pollencarriers. Style-apex rounded at top, bearing a rather large dome-shaped apex. Fruit not known.

Perak: at Tjuk, Scortechini 1162.

3. Marsdenia thyrsiflora, Hook. f. in Fl. Br. Ind. IV. 37 (1883). A climbing shrub; branches pale brown, terete; uppermost branchlets minutely puberulous. *Leaves* membranous; broadly ovate or deltoid-

ovate, acuminate at apex, deeply (often 1 to 1.25 in.) cordate at base, the sinus ·5 to ·75 in. broad; glabrous on both surfaces on young leaves only, slightly puberulous on the nerves beneath; 4 to 8 in. long, 2 to 6 in. broad; midrib rather broad with a cluster of small glands at its base; main nerves 5 to 7 pairs, the lowest 1 to 2 pairs in the basal lobes deflexed, the others curving upwards to anastomose near the margin; reticulations slender, prominent; petiole 1 to 3.5 in. long, terete. Cymes lateral, 4 to 6 in. long, puberulous, spicate or racemose; rachis flexuous, somewhat flattened; flowers in clusters of about 3 to 6 on a tubercular base; bracts small, acute; pedicels slender, 1 in. long; Calyx deeply cleft; lobes ovate-lanceolate, obtuse, the margins hyaline; scales long, subulate. Corolla urceolate, glabrous without and within; lobes short, much thickened, lanceolate. Coronaprocesses none, or reduced to a rounded film attached to the back of the anthers. Stamens with small spurs to the anthers; appendages long, acuminate, connivent over the style-apex. Style-apex 5-lobed, flat, with a fusiform tip. Follicles (usually 1 only) lanceolate, 2 in. long, 25 in. broad, recurved, acuminate; pericarp thinly coriaceous, smooth, glabrous. Seeds ovate, 2 in. long, 1 in. broad, broadly winged; coma short, white-silky; testa very thin, pale brown; cotyledons elliptic, ·025 in. long; radicle as long as cotyledons. Prain Beng. Plants 696. M. tinctoria in part, Herb. Hook. f. and Th.

Pahang: at Talian river, Ridley 2414.—DISTRIB. India (Assam, Khasia Hills, jheels of Lower Bengal).

4. Marsdenia volubilis, T. Cooke, Fl. Bomb. II. 166 (1904). A stout climbing shrub with rough brown corky bark; branchlets pale brown with occasional lenticels; innovations whitish-puberulous. Leaves somewhat coriaceous when fresh, membranous when dry; broadly ovate or suborbicular, acuminate at apex, cordate or truncate or rounded, occasionally slightly cuneate at base; young leaves minutely tomentose, especially on the under surface, afterwards glabrous, ashy grey when dry; 2.5 to 6 in. long, 1.75 to 4.5 in. broad; midrib stout, raised beneath, furnished with a few small glands in a cluster at the base adjoining the petiole; main nerves also raised beneath, 4 to 6 pairs, the lowest 2 pairs from close by the base, spreading and curving upwards; reticulations prominent, usually raised, larger ones transverse; petiole ·5 to 1·5 in. long, stout or slender. Cymes umbellate, glabrous or mealy-pubescent, many-flowered; peduncles 1 to 2 in. long, slender, arising from between the petioles; bracts ovate-acuminate, sometimes leafy; pedicels slender, 25 to 1 in. long; buds globose, depressed; flowers bright green. Calyx-lobes ovate-oblong, obtuse, ciliolate, 1 in. long; glandular scales 5, minute, between the lobes. Corolla rotate,

deeply divided: tube 1 to 15 in. long; lobes rounded, rather longer, glabrous without and usually within. Corona-processes large, fleshy, rounded, with a short beak extending over the top of the staminalcolumn and style-apex. Staminal-column arising from the base of the corolla; appendages membranous, ovate, obtuse, arching over the stigma; pollen-masses oblong-spathulate, large, waxy, attached by short thick caudicles to the linear-oblong pollen-carriers. Ovary of 2 pubescent carpels; style-apex dome-shaped. Follicles 2 (or 1, by abortion), broadly lanceolate, tapering to a blunt point, divaricate in a straight line, 3 to 4 in. long, 1 in. broad; pericarp smooth, yellow, mealy when young. Seeds broadly ovate, 5 in. long, 3 in. broad, broadly winged; the tip truncate, with a 2 in. long coma of white silky hairs; testa smooth, shining; cotyledons ovate, 3 by 2 in., flat; radicle Dregea volubilis, Benth. Gen. Pl. 775 ex Hook, f. Fl. Br. Ind. IV. 46: Trimen Fl. Cevl. III. 161: Prain Beng. Plants 697. Hoya viridiflora, Br. in Mem. Wern. Soc. Edinb. I. 27; Wight Contrib. 39, and in Hook. Bot. Misc. II. 98, t. 1, and Ic. t. 586; Wall. Cat. 8168; Dalz. & Gibs. Bomb. Fl. 153; Griff. Ic. Pl. Asiat. t. 387, 388. Asclepias volubilis, Linn, f.; Roxb. Fl. Ind. ii. 36. Apocynum tiliæfolium, Lamk. Encycl. I. 214. Wattakaka viridiflora, Hassk. in Flora 1857, 79. "Watta-kaka-codi," Rheede Hort. Mal. IX. t. 15.

SIAMESE STATES: Pulau Badak, *Curtis* 2997.—DISTRIB. India, Ceylon, Java.

The only Malay specimen available is a poor one, with small umbels and flowers smaller than in the usual Indian forms, but the structure agrees with the latter.

23. Pergularia, Linn.

Leaves opposite. Flowers of moderate size, Twining shrubs. numerous, in pedunculate or subsessile umbelliform cymes, lateral between the bases of the petioles. Calyx 5-partite; scales within 5 or none. Corolla hypocrateriform; tube inflated at the base; lobes 5. erect, overlapping to the right. Corona of 5 erect processes arising from the base of the staminal-column and adnate to it in the lower part, free above and with a narrow or subulate process on the inner face. Staminal-column arising from the base of the corolla; anthers oblong, erect, with long erect membranous appendages conniving over the apex of the style; pollen-masses solitary in each anther-cell, erect. attached in pairs to the pollen-carriers by very short caudicles. Ovary of 2 carpels; style not exceeding the anther-appendages; style-apex stout, ovoid-pentagonal. Follicles lanceolate, terete, rather turgid. Seeds ovate, concave, comose.—DISTRIB. About 10 species, chiefly Indian and Malayan, one in Tropical and South Africa.

Pergularia puberula, Miq. Fl. Ind. Bat. II. 495 (1856). A twining shrub; branchlets slender, terete, puberulous as are the innovations. Leaves membranous; ovate or oblong-ovate, acuminate at apex, rounded or shallowly cordate at base, puberulous when young. when older only on the nerves; 3 to 5 in. long, 2 to 3 in. broad; midrib slender, with a tuft of minute glands at the base above the petiole; main nerves 6 to 7 pairs, the lowest 2 pairs rather close together, the rest distant, curving upwards to anastomose near the margin; reticulations transverse, prominent on the lower surface; petiole slender. puberulous, 1 to 1.5 in. long. Cymes umbelliform, in pairs on the top of a 5 to 2 in. long peduncle, puberulous, many-flowered; bracts minute, subulate; pedicels slender, 25 to 5 in. long; buds oblong-conical. Calyx membranous; lobes ovate-obtuse, unequal, 05 to 1 in. long, puberulous, ciliate on the margins; scales obscure. Corolla pubescent without; tube 25 in. long, inflated below, slightly contracted at the mouth; lobes linear-oblong, obtuse, hispidly ciliate, as long as tube. Corona-processes laterally compressed, 2-winged below, beaked above, the inner face with a subulate curved appendage arching over the anthers and longer than them. Pollen-masses oblong, obtuse, attached a little above their bases by very short stout caudicles to the bifid pollen-carriers. Style-apex rounded-conical. Fruit not known. Hook. f. Fl. Br. Ind. IV. 38.

Penang: Phillips; at Penara Bakit, Curtis 932.—Distrib. Java (Horsfield, Kurz).

P. minor, Andr. Bot. Rep. t. 184, is a garden species found in cultivation in India and Malaya, and prized for its greenish-yellow scented flowers. Its native home is uncertain. MALACCA: Griffith.

24. Stephanotis, Thouars.

Twining shrubs, often long-scandent. Leaves opposite, coriaceous. Flowers in umbelliform axillary pedunculate cymes, usually large, white and sweet-scented. Calyx 5-partite, with large lobes; glandular scales usually none. Corolla hypocrateriform; tube long, cylindric, inflated at the base; lobes twisted, overlapping to the right. Corona of 5 processes, adnate to the back of the anthers, flattened, sometimes none. Staminal-column arising from the base of the corolla; anthers erect, with erect or inflexed membranous appendages; pollen-masses solitary in each anther-cell, erect, attached in pairs to the carriers by very short caudicles. Ovary of 2 carpels; style short; style-apex conical or shortly beaked, hardly or not exserted. Fruit of 2 very thick, obtuse or acuminate, follicular mericarps. Seeds comose.—Distrib. About

15 species, chiefly from Madagascar, a few from the Malay Archipelago and China.

STEPHANOTIS MAINGAYI, Hook. f. Fl. Br. Ind. IV. 39 (1883). A stout, long-scandent, climbing shrub; branchlets stout, pale brown, puberulous with retrorse curved tubercular hairs. Leaves coriaceous, chartaceous when dry; ovate or ovate-oblong, acuminate at apex, shortly cordate at base; both surfaces glabrous and yellow when dry; margins recurved; 4 to 6 in. long, 2 to 3 in. broad; midrib slender but prominent, raised beneath; main nerves 8 to 10 pairs, the lowest pair nearly at right angles to the midrib, the rest at about 45°, nearly straight, joining towards the margin in a looped intramarginal nerve; reticulations distant, transverse; petiole pubescent, 5 to 1 in. long; Cymes few-flowered; peduncle 1 to 3 in. long, stout; bracts small, subulate-acuminate; pedicels stout, puberulous, .75 to 1.5 in. long; buds elongate-clavate; flowers pale sulphur-yellow, large, fragrant, 2.5 in. in diam. Calyx glabrous, except at extreme base; tube very short; lobes oblong-lanceolate, acute, 3-nerved with netted reticulations, .75 in. long, .3 in. broad; scales none. Corolla-tube 1 in. long, thick, with 5 thick ridges within opposite the anthers, the hollows between the ridges filled with brown stiff retrorse bristles; lobes slightly longer than the tube or equal to it, ovate-lanceolate, acuminate, spreading. Corona none. Staminal-column in all 5 in. long, stout, on a thickened base; anther-wings horny; appendages pale, oblong, obtuse; pollen-masses oblong, with very short scarcely apparent caudicles. Style-apex capitate, flattened, on a short column supported by a thickened ring. Fruit not known.

Malacca: climbing extensively over trees, Maingay (K.D.) 1112. Singapore: Hullett 147.

25. Tylophora, Br.

Erect or twining perennials. Leaves opposite. Flowers small, lateral between the bases of the petioles or axillary, in simple or branched cymes of flower-clusters or short racemes, or sometimes in sessile flower-clusters at the nodes of the stem. Calyx 5-partite, 5-glandular within. Corolla rotate or rotate-campanulate, deeply 5-lobed, the lobes slightly overlapping to the right. Corona of 5 small fleshy tubercular processes, adnate to or radiating from the filament part of the staminal-column and arising from near its base. Staminal-column arising from the base of the corolla; anthers erect, small, with small membranous appendages; pollen-masses very minute, erect, suberect or horizontal, attached by their middle or near their base to very slender caudicles by which they are affixed in pairs to the pollen-

carriers. Ovary of 2 carpels; style-apex pentagonal or 5-lobed, depressed, flattened or convex, rarely slightly exceeding the anthers. Fruit of 2 (or by abortion 1) follicular mericarps, smooth, acute or acuminate, sometimes inflated or winged. Seeds comose.—Distrib. About 40 species: widely distributed in the tropical and subtropical regions of the Old World and Australia.

Leaves and branches and cymes glabrous; corona-processes globose, without free points above; calyx glabrous:-Flowers rather large, 3 in. broad at least; leaves usually over 2 in. long :-Corona-processes globose, shorter than the anthers; leaves 2.5 to 6 in. long 1. T. longifolia. Corona-processes globose, as long as the anthers; leaves 1 to 3 in. long 2. T. globifera. Flowers very small, 1 in. broad; leaves under 2 in. long .. 3. T. tenuis. Branches and inflorescence more or less pubescent; calyx pubescent :-Corona-processes globose, without free tips above; follicles where known slender, acuminate:-

Leaves glabrous; corolla very small . . . 4. T. exilis.

Leaves tomentose; corolla about 3 in. broad . . . 5. T. hirsuta

.. 5. T. hirsuta var. penangensis.

Corona-processes with small free points above; follicles broad, ventricose, obtuse:—

Leaves 3 to 6 in. long, not or very slightly cordate at base.. 6. T. Wallichii. Leaves 5 to 7 in. long, deeply cordate at base.. 7. T. perakensis.

1. Tylophora longifolia, Wight Contrib. 50 (1834). A slender twiner; stems pale brown, glabrous, striate when dry. Leaves membranous when dry; ovate-lanceolate or oblong-lanceolate, acuminate at apex, rounded or slightly cordate at base; glabrous on both surfaces; 2.5 to 6 in. long, .75 to 1.75 in. broad; midrib slender, raised beneath, with a tuft of minute glands at the base just above the petiole; main nerves 7 to 8 pairs, the lowest 2 pairs close to the base, the rest sharply curved upwards to and along the margin, all raised beneath; reticulations scanty, transverse; petiole slender, 5 to 75 in. long, pubescent in the channel on the upper surface. Cymes paniculate, glabrous, lateral between the leaf-petioles, up to 4 in. long; peduncles slender, 1 to 2 in. long; branches divaricate, slender; flower-clusters distant, umbellate, 2- to 5-flowered; pedicels capillary, 2 to 3 in. long; buds ovoid; flowers rather large, up to 4 in. in diam., yellowish-green or -red. Calyx glabrous; lobes lanceolate, 025 in. long; scales minute. Corolla rotate; tube very short; lobes oblong-lobtuse, 5- to 7-nerved, membranous, 1 in. long. Corona-processes dilated, globose, shorter

than the anthers. Anthers broad; appendages short, incurved; pollen-masses ovoid, horizontal, attached by minute straight caudicles to the slightly spurred pollen-carriers. Ovary of 2 carpels; style-apex pentagonal, tip convex. Follicles 2, divaricate at right angles, lanceolate, poniard-shaped, long-acuminate, 3.5 to 4.5 in.long, .25 in. broad; pericarp thin, smooth. Seeds oblong, broadly winged, .4 to .5 in. long, .15 to .2 in. broad, base rounded; tip broadly truncate, bearing a white silky coma 1.5 in. long; testa thin, dark brown, smooth; cotyledons elliptic, .075 in. long, nerved; radicle cylindric, .05 in.long. Wall. Cat. 8205; Done. in DC. Prodr. VIII. 608; Hook. f. Fl. Br. Ind. IV. 42.

PERAK: on Maxwell's Hill, 3500 ft., Wray 4185; do. Ridley 5514; Scortechini; at 3500 to 4000 ft., King's Collector, 3317, 3318, 6301; at Cottage Hill, 4000 to 6000 ft., Curtis 145, 2087.—Distrib. India (Sikkim, Khasia Hills, Sylhet).

2. Tylophora globifera, Hook. f. Fl. Br. Ind. IV. 41 (1883). slender, glabrous, twining undershrub; branchlets glabrous, terete. Leaves membranous; ovate or ovate-lanceolate, acuminate at apex, rounded or slightly cordate at base; both surfaces glabrous, smooth; margins slightly recurved; 1 to 3 in. long, 5 to 1.5 in. broad; midrib slender, raised beneath; main nerves 4 to 7 pairs, at first nearly straight, then curving to join in an intramarginal looped nerve; petiole 25 to 5 in. long, slender. Cymes long-peduncled, compressed, few-flowered, more or less umbellate; peduncles about 1 in. long; bracts lanceolateacuminate; pedicels filiform, 5 to 75 in. long; buds ovoid, depressed; flowers blue (Kunstler). Calyx glabrous; lobes ovate-lanceolate, 1 in. long. Corolla 3 in. in diam., cleft half-way down; lobes ovate, 15 in. long, prominently nerved. Corona-processes globose, large, as high as the anthers. Anther-appendages short, crenate, incurved over the style-apex; pollen-masses ellipsoid, horizontal, joined by straight caudicles to the small oblong pollen-carriers. Style-apex 5-lobed; tip convex. Fruit not known.

PERAK: banks of Bernam river, King's Collector 8853. MALACCA: Griffith 3764.—DISTRIB. Andaman Islands, Borneo.

3. Tylophora tenuis, Blume Bijdr. 1062 (1826). A slender twiner; stems much branched, very slender, glabrous; the nodes pubescent, the internodes sometimes only. Leaves somewhat fleshy when fresh, membranous when dry; variable in shape, ovate-elliptic or -oblong or -lanceolate, acute or apiculate at apex, rounded or slightly cordate at base; margins recurved; '75 to 2 in. long, '25 to 1 in. broad; midrib slender, puberulous above; main nerves 4 to 5 pairs, indistinct, nearly straight to join an intramarginal looped nerve; reticulations obscure;

petioles 25 to 5 in. long, puberulous in the channel on the upper side. Cymes from between the petioles, very slender, paniculate, glabrous, reaching 4 to 5 in. in length; rachis filiform, flexuose, its branches divaricate, finally bearing few-flowered subumbellate racemes; pedicels filiform, 25 to 5 in. long; bracts minute, lanceolate-subulate; buds globose; flowers dark purple. Calyx glabrous; lobes lanceolate, 025 in. long. Corolla rotate; tube short; lobes ovate-oblong, obtuse, 3-nerved. Corona-processes inflated, somewhat annular-globose, as long as the filaments. Anthers slender; appendages very short, incurved; pollenmasses minute, horizontal, ovoid, attached by straight caudicles to the rather slender pollen-carriers. Ovary of 2 carpels; style-apex pentagonal, top convex. Follicles 1 or 2, 2 to 3 in. long, lanceolate, poniardshaped, long-acuminate; pericarp membranous, smooth. Seeds ovate, ·2 to ·25 in. long, broadly winged, dentate below, truncate at tip, and bearing a white silky coma .75 to 1 in. long; testa dark brown, striate, sparsely tubercular; cotyledons elliptic, radicle cylindric, both together ·05 to ·1 in. long. Done. in DC. Prodr. VIII. 608; Miq. Fl. Ind. Bat. II. 488; Hook. f. Fl. Br. Ind. IV. 42; Trimen Fl. Ceyl. III. 158; Cooke Fl. Bomb. II. 162; Prain Beng. Plants 698. T. carnosa, Wall. in Wight Contrib. 49; Wall. Cat. 8200; Wight Ic. t. 351; Done. in DC. l. c. 607; Miq. l. c. 488. T. tenuissima, Wight Contrib. 47, and Ic. t. 588; Dalz. & Gibs. Bomb. Fl. 150; Done. in DC. l. c. 607. Asclepias tenuissima, Roxb. Hort. Beng. 20, and Fl. Ind. II. 41. A. dichotoma, Rottl. in Wall. Cat. 8200 B.C. Ceropegia Decaisneana, Mig. Pl. Hohenack. 634.

Penang: Curtis 1526. Perak: Wray 2125; Scortechini; King's Collector 6099, 10600. Malacca: Griffith; Maingay (K.D.) 1108, 1139. Johore: Ridley 4030, 9162. Singapore: Ridley 5746; Kunstler 113, 266.—Distrib. India, Burma, Ceylon, Java, Borneo (Haviland 3060).

4. Tylophora exilis, Colebr. in Trans. Linn. Soc. XII. 358, t. 16 (1817). A slender twiner; branchlets pale brown, terete, slender, puberulous. Leaves chartaceous when dry; ovate-oblong or -lanceolate, shortly and abruptly acuminate at apex, rounded at base; glabrous on both surfaces; margins recurved; 2 to 3 in. long, 1 to 1.5 in. broad; midrib slender, impressed above, raised beneath, with a few minute glands at its base; main nerves 4 to 6 pairs, the lowest 2 pairs close together, the rest distant, curving upwards to meet in a looped intramarginal nerve raised above; secondary nerves few; reticulations obscure; petiole slender, 5 to 1 in. long, articulate at the base. Inflorescence longer than the leaves, up to 4 in. long, puberulous; rachis slender, flexuous, simple or rarely branched, bearing at its nodes umbellately racemose flower-clusters, the clusters many-flowered; bracts

minute, persistent; pedicels slender, 1 to 15 in. long; buds very small, globose; flowers light brown. Calyx pubescent without; lobes ovate acute, ciliate, 04 in. long; scales minute. Corolla rotate, very small, glabrous, membranous; lobes 05 in. long, 3-nerved. Corona-processes inflated, obtuse, shorter than the anthers. Anthers slender; appendages short, membranous; pollen-masses ovoid, attached by very short straight caudicles to the minute slightly spurred pollen-carriers. Ovary of 2 carpels; style-apex pentagonal, flat, very slightly convex at tip, Follicle 1, subulate, acuminate, 3 to 4 in. long, 25 in. broad; pericarp chartaceous, smooth, glabrous. Seeds ovate-oblong, 25 to 35 in. long, ·1 in. broad, slightly contracted above below the broad truncate tip, which bears a white silky coma .75 to 1 in. long, denticulate at base, broadly winged; testa brown, thin, shining, striate; cotyledons elliptic, ·1 in. long, 3-nerved; radicle cylindric, ·05 in. long. Wight Contrib. 50; Wall. Cat. 8206; Done. in DC. Prodr. VIII. 608; Hook. f. Fl. Br. Ind. IV. 44; Prain Beng. Plants 698. Pergularia exilis, Spreng. Syst. I. 844.

PERAK: at Kota, Wray 2417, 3053; King's Collector 6470. DINDINGS: on Pangkore Island, Scortechini 1035. MALACCA: Griffith 3764.— DISTRIB. India (Assam, Sylhet, Chittagong).

5. TYLOPHORA HIRSUTA, Wight Contrib. 49 (1834); Wall. Cat. 8201; Dene. in DC. Prodr. VIII. 607; Hook. f. Fl. Br. Ind. IV. 43. T. Jacquemontii, Dene. l. c. Gymnema hirsutum, Wall. Tent. Fl. Nep. 50.—Distrib. India (Himalaya from Kumaon eastwards, Eastern Bengal).

VAR. penangensis, Hook. f. in Fl. Br. Ind. IV. 43. A climbing shrub; branchlets densely ferruginous tomentose. Leaves subcoriaceous; ovate or ovate-lanceolate, acuminate at apex, attenuate, rounded, or somewhat cordate at base; both surfaces ferruginous-tomentose, the hairs with bulbous bases; 2 to 4 in. long, 1 to 1.75 in. broad; midrib rather stout; main nerves 4 to 6 pairs, curved upwards to and along the margin; reticulations netted; petiole 5 to 75 in. long, densely tomentose. Cymes ferruginous-villous, much branched, 1 to 5 in. long: branches dichotomous; flowers in racemiform clusters on enlarged many-bracteate rachises; bracts ovate-acuminate; pedicels very slender, ·25 to ·5 in. long. Calyx-lobes pubescent, very small, ·3 in. long, ovateacute. Corolla deeply cleft; lobes triangular-ovate, acute, 1 in. long. Corona of 5 subglobose processes on the backs of the anthers and shorter than them. Anther-appendages short, incurved; pollen-masses nearly globose, horizontal, attached by slender slightly curved caudicles to the oblong pollen-carriers. Style-apex 5-angled, included within the anthers. Fruit not seen. T. mollissima, Wall. Cat. 8202.

Penang: Phillips; at Waterfall stone-quarry, Curtis.—Distrib. China? Wallich 8202 (cult. in Hort. Calc.).

After examining specimens at Kew, we prefer to leave this plant in its present rather doubtful position, rather than to accept the suggestion in Fl. Br. Ind. that it may be T. villosa, Blume, of Java. Its place will probably have to be reconsidered when better specimens are available.

6. Tylophora Wallichii, Hook. f. Fl. Br. Ind. IV. 45 (1883). A slender twining shrub; branchlets slender, terete, vounger puberulous. Leaves thickly coriaceous when green, chartaceous when dry; ovatelanceolate or ovate-oblong, acuminate at apex, rounded or slightly cordate at base; both surfaces glabrous except the nerves beneath when young; margins slightly recurved; 3 to 6 in. long, 5 to 2 in. broad; midrib rather stout, raised beneath, with a few minute glands at the base above the petiole; main nerves 6 to 8 pairs, curving upwards to join in a rather obscure intramarginal looped nerve; reticulations transverse, obscure; petiole slender, puberulous, 75 to 1 in. long, articulate at the base. Inflorescence lateral from between the bases of the petioles, often longer than the leaves, divaricately branched, subsessile or on peduncles 5 to 75 in. long; branches slender, long; flower-clusters racemose, pubescent, with many minute ovate-acute sheathing persistent bracts; pedicels capillary, 3 to 4 in. long, pubescent; buds globose; flowers pale yellow. Calyx membranous; lobes ovate-oblong, acute, 5 in. long, ciliate, pubescent without; scales minute. Corolla rotate-campanulate; tube '05 in. long; lobes ovate-oblong, acute, '1 in. long, thin, 5-nerved. Corona-processes thick, rounded, fleshy, ending in a cuspidately acute point, reaching to the level of the style-apex. Anthers narrow; appendages very short; pollen-masses very minute, nearly globose, attached by very slender straight caudicles to the minute pollen-carriers. Style-apex pentagonal; top convex. Follicle 1, recurved to the horizontal, 3.5 to 4 in. long, 1 in. broad, oblong-ellipsoid ventricose, obtuse at the tip; pericarp light green, pale brown and chartaceous when dry and longitudinally striate. Seeds flattened, 5 in. long, broadly ovate, with a broad wing; testa brown, shining; tip truncate, bearing a 1 in. long white silky coma; cotyledons broadly ovate, 3-nerved, 15 to 2 in. in diameter; radicle cylindric, 075 in. long. Gymnema Wallichii, in part, Wight Contrib. 46. G. sagittatum, Wall. Cat. 8194B.

Penang: in Pulau Betong Reserve, Curtis 933. Perak: Wray 3047; King's Collector 5259, 5439. Malacca: Griffith; Maingay (K.D.) 1142. Singapore: Wallich 8194B.

7. Tylophora perakensis, King & Gamble, n. sp. A climbing shrub; branches stout, fleshy; branchlets smooth, striate, pale brown

when dry; internodes long. Leaves membranous when dry; ovate, acuminate at apex, deeply cordate at base; glabrous on both surfaces; 5 to 7 in. long, 2 to 3 in. broad; midrib slender, raised beneath, bearing a small cluster of glands at the base just above the petiole; main nerves 9 to 10 pairs, the lowest 1 or 2 pairs decurved into the basal lobes, the rest curving upwards to anastomose near the margin in an obscure looped nerve; reticulations few, transverse, prominent when dry; petiole fleshy, glabrous, 1 to 3 in. long, articulate at the base. Inflorescence lateral from between the petioles, as long as or longer than the leaves, divaricately branched, glabrous; peduncles stout, 1 to 1.5 in. long; branches long, slender; flower-clusters umbellate, 6- to 8-flowered; bracts minute, usually soon deciduous; pedicels capillary, ·1 to ·2 in. long; buds ovoid; flowers green. Calyx pubescent without; lobes ovate-acute, 075 in. long, ciliate; scales subulate. Corolla campanulate-rotate; tube short; lobes oblong-obtuse, 5-nerved, thickened, minutely pubescent above. Corona-processes nearly globose, fleshy, shorter than the anthers; point small, appressed to the anthers, acute. Anthers slender above; appendages acuminate, incurved; pollenmasses nearly globose, very minute, attached by slender straight caudicles to the minute pollen-carriers. Style-apex pentagonal, top convex. Follicle 1, ventricose, only slightly recurved, 5 to 6 in. long, 1.5 in. broad, oblong, very obtuse at tip; pericarp light green and glossy when fresh, chartaceous when dry, striate longitudinally; dissepiments fibrous-crustaceous. Seeds flattened, 5 in. long, broadly ovate, with a broad wing; testa brown, shining; tip with a .75 in. long white silky coma; cotyledons broadly ovate, 3-nerved, 15 in. long; radicle eylindric, .075 in. long.

Perak: at lower camp, Gunong Batu Pateh, 3400 ft., Wray 1227; in open jungle at 200 to 300 ft., King's Collector 5761, 7178, 8343; at Ipoh, Curtis 3186.—Distrib. Borneo (Teysmann 11578; Motley 625).

This species comes very near to *T. Wallichii*, but is much larger and more glabrous, has more deeply cordate leaves, a larger inflorescence with umbellate instead of racemose flower-clusters, a less beaked corona and longer anther-appendages. Curtis' No. 3186 has one inflorescence with the flower-clusters racemose and the others umbellate, and seems to come between the two species, but in other respects it belongs to this.

26. Heterostemma, W. & A.

Twining shrubs. Leaves opposite, often 3- to 5-nerved at the base. Flowers small, in lateral sessile or pedunculate umbellate or racemose cymes. Calyx 5-partite. Corolla campanulate, urceolate or rotate; lobes triangular, valvate or slightly overlapping to the right. Corona

of 5 thin or fleshy processes spreading more or less horizontally from the staminal-column, usually with an erect tubercle on the upper side; the tips flat or dentate or laciniately cleft. Staminal-column short, depressed; the anthers minute, ending in a small membranous appendage; pollen-masses 1 in each anther-cell, subquadrate or rounded, sometimes with a thin margin on the inner side, erect, sessile or attached by very short caudicles to the pollen-carriers. Ovary of 2 carpels, distinct or combined; style-apex pentagonal, flat, not exserted beyond the anthers. Fruit of 2 distinct or adherent slender straight follicular mericarps. Seeds thin, winged, comose; the margin recurved.—Distrib. About 10 species, Indian and Malayan.

Corolla rotate-campanulate; corona thin, long, entire or laciniate, spreading horizontally; leaves truncate or cordate at base .. 1. H. piperifolium. Corolla ovoid-urceolate; corona thick, short, much fimbriate, more or less erect; leaves cuneate at base .. 2. H. fimbriatum.

1. Heterostemma piperifolium, King & Gamble, n. sp. A slender twining shrub; branchlets pale, terete, slightly channelled when dry, uppermost very minutely puberulous. Leaves membranous when dry, 3- to 5-nerved; triangular-ovate, acuminate at apex, broadly truncate at base, sometimes slightly decurrent; both surfaces minutely puberulous, the lower the most; 2.5 to 3.5 in. long, 1.5 to 2.5 in. broad; midrib slender, furnished at the base with 1 or more rather conspicuous glands; main nerves 4 pairs, the lowest 2 pairs from the base, the first pair very small, the second strong and with the others curving upwards to join near the margin; reticulations few, obscure, irregular; petiole slender, twisted, .75 to 2 in. long. Cymes few-flowered, umbellately racemose, on stout 5 to 75 in. long peduncles; the rachis of the raceme thickened, with minute bracts; pedicels slender, 25 in. long; buds globose, depressed; flowers yellow. Calyx-lobes ovate, 05 in. long, ciliate, the margins hyaline; scales minute. Corolla rotate-campanulate, 3 in. broad, puberulous without, the base short at first, then spreading, divided about half-way down; lobes triangular, incurved. Corona-processes spreading, lying flat on the corolla, 1 in. long, linear-lanceolate, entire or variously laciniate, the upper part with a slight rounded protuberance or nearly flat. Staminal-column short; appendages membranous, curved over the style-apex; pollen-masses erect, waxy, flattened on the inner, curved on the outer edge, sessile on the triangular-elongate pollen-carrier. Carpels distinct; style-apex thin, flattened, 5-gonal. Follicles slender, long-acuminate, recurved to about 3 right angles, 4 to 5 in. long, 15 to 2 in. broad; pericarp thin, smooth. Seeds ovate-oblong, very thin, with broad thin margins; apex bearing a ·75 in. long white silky coma; testa very thin, brown.

Perak: at Kwala Dipang, Ridley 9619; at Larút, 200 to 500 ft., King's Collector 2338, 7973; at Ijuk, Scortechini 1097, 1150.

At first sight this species closely resembles H. chrysanthum (Symphysicarpus chrysanthus, Hassk.), but differs completely in the corona and in the very divaricate follicles.

VAR. cordatum, King & Gamble. Leaves cordate to a depth of about 4 in.; main nerves 5 to 6 pairs, the basal pairs 3, of which the lowest much deflexed in the lobes of the leaf. Corona-lobes usually entire. Rest as in the type.

PERAK: Scortechini. Only one rather poor specimen of this is available.

2. Heterostemma fimbriatum, King & Gamble, n. sp. A twining shrub; stems pale brown, with 2 longitudinal lines of hairs. Leaves fleshy, chartaceous when dry; oblong or oblong-lanceolate, acuminate at apex, cuneate at base; both surfaces glabrous, lower pale; margins slightly recurved; 3.5 to 4.5 in. long, 1.5 to 2 in. broad; midrib stout, raised beneath when dry, furnished with a cluster of rounded glands at the base above the petiole; main nerves 5 pairs, prominent and raised when dry, with a slender obscure pair in addition from the very base, the second pair from about 25 in. above the base, all obliquely curved upwards to join in a looped intramarginal nerve; reticulations not visible even when dry; petiole stout, 5 to 75 in. long, much curved and swollen at the base. Cymes racemose, on short (15 in.) very stout peduncles: the rachises of the racemes about 3 in. long, thick, strobilate. with cushion-like bracts; pedicels slender, angular, 5 in. long, puberulous: buds rather large, ovoid-orbicular. Calux very small: lobes minute, ovate-acute, ciliate. Corolla ovoid-urceolate, thick, fleshy. pubescent without, glabrous within, 3 to 4 in, long, divided at most to one-third of its length in triangular lobes slightly overlapping to the right and erect. Corona-processes nearly erect, attached to the staminal-column, thick, fimbriate at the tips in 2 rows of subulate teeth. Staminal-column short; anther-cells rounded; appendages very small, membranous, bifid; pollen-masses rounded, with a thin straight margin on the inner side, nearly horizontal, sessile on a triangular pollen-carrier. Carpels distinct, elongate; style-apex 5-gonal, tip concave. Fruit not known.

PERAK: at G. Ijub, Scortechini 1220.

Only one rather poor specimen of this is available. The plant seems to be an *Oianthus*; but that genus—as suggested by Hooker in the Fl. Br. Ind., and by Bentham in his remarks to Ic. Pl. t. 1191, under *O. urceolatus*, Benth., to which this species is very close—seems scarcely separable from *Heterostemma*. In many ways our species strongly resembles *H. alatum*, Wight.

27. Hoya, Br.

Twining pendulous (rarely erect) or rambling and rooting, often epiphytic, shrubs. Leaves opposite, usually thick and fleshy or coriaceous. Flowers in axillary, lateral or terminal, umbelliform, racemose cymes, usually on a thickened tuberculate rachis, sessile or pedunculate. Calyx small, 5-partite, with 5 glandular scales. Corolla rotate or rotatecampanulate, fleshy or waxy; lobes 5, often convex or spreading or reflexed, valvate in bud. Corona-processes 5, large, fleshy-membranous or horny, adnate to the staminal-column; the lower lobe stellately spreading or ascending, turgid or compressed, often concave on the upper surface; the upper lobe usually produced into a tooth or process which is erect and incumbent on the anther. Staminal-column usually short, arising from the base of the corolla; anthers conniving over the style-apex, membranous; appendages membranous, erect or inflexed; pollen-masses 1 in each anther-cell, erect, waxy, usually flattened, often thickened on the outer margin, attached by caudicles of various shapes, usually short, sometimes enlarged thickened or cup-shaped, sometimes long, to the horny hard pollen-carriers. Ovary of 2 distinct carpels: style-apex 5-angled, tip flattened or conical-apiculate. Fruit of 1 or 2 follicular mericarps, usually slender with a thin pericarp, rarely turgid with a thick one. Seeds small, oblong or ovate, comose; cotyledons flattened, thick; radicle cylindric.—DISTRIB. About 70 species, found in Tropical Asia and Australia.

Corolla reflexed, lobes longer than broad :-

Staminal-column sessile; corona-processes inflated:-

shorter-curved; corolla-tube with a broad annular ring (corolline corona?) (Sect. III. Kloiophora) ...

Corolla spreading, lobes spreading or incurved, rarely reflexed, broader than long; staminal-column sessile or subsessile; corona-processes with lower lobes spreading, upper acute (Sect. IV. Euhova):—

Corona with lower lobes of processes obtuse:-

Lower lobes suberect, laterally compressed; leaf-nerves horizontal:—

Lower lobes rounded, inflated; upper lobes acuminate; stems thick; leaves thick, fleshy, over 4 in. long:—

Flowers yellow; corolla under 1.5 in. in diam. .. 4. H. obtusifolia.

1. H. multiflora.

2. H. lasiantha.

3. H. Curtisii.

Flowers dark purple; corolla much over 1.5 in. in diam.	5.	H.	imperialis.
Lower lobes beaked; upper lobes short, acute; stems	5		
slender; leaves thin, under 4 in. long	6.	H.	elliptica.
Lower lobes horizontal or nearly so, flattened above; leaf-			
nerves usually at an acute angle with the midrib:-			
Flowers large, reaching 1.5 in. in diam.; leaves velvety			
pubescent beneath; caudicles of pollen-masses long,			
slender, twisted	7.	H.	coronaria.
Flowers small, rarely '5 in. in diam.; leaves glabrous			
beneath; caudicles short, usually thick:			
Lower lobe of corona very thick and blunt vertically,			
upper short; leaves ovate-lanceolate, cordate, faintly			
nerved	8.	H.	Scortechinii.
Lower lobe of corona thin vertically, short :-			
Leaves obscurely nerved, about 3 to 4 pairs, very			
thick; lower corona-lobes obtuse; upper long, acu-			
minate; appendages very long acuminate		H.	caudata.
Leaves prominently 3- to 5-nerved, very thick;			
peduncles many from the axils; lower corona-lobes			
concave, obtuse	10.	H.	latifolia.
Leaves not 3-nerved from the base; peduncles usually			
1 only at the axils:—			
Leaves small; main nerves at right angles to the			
		H.	lacunosa.
Leaves moderate-sized, under 4 in. long; elliptic or			
obovate; main nerves indistinct, at about 60° with			
		H.	diversifolia.
Leaves large, over 7 in. long, oblanceolate; main			
nerves prominent, as are reticulations; trailer,			
		H.	Maingayi.
Corona with lower lobes of processes acute or nearly so:-			
Leaves with nerves easily visible when dry:—			
Leaves with 5 basal nerves, the lowest pair faint	14.	H.	parasitica.
Leaves pinnately nerved :—			
Flowers moderately large, 5 in. in diam. in bud; leaves			
with not very conspicuous reticulations; follicles with			
very thick pericarp	15.	H.	coriacea.
Flowers small, ·25 in. in diam. in bud:—			
Leaves large, usually over 5 in. in length and 1.5 in.			
in breadth; main nerves very prominent:			
Main nerves at 40° with the midrib; reticulations			
prominent, chiefly on upper surface, but not sharp	16.	H.	Forbesii.
Main nerves at 60° with the midrib; reticulations			
very prominent and sharp on both sides; follicles			
with thin pericarp	17.	H.	Finlaysonii.
Leaves moderate-sized, usually under 5 in. in length			
and 1.75 in. in breadth; main nerves nearly at right			
angles to midrib, rather faint on both surfaces	18.	H.	Ridleyi.
Leaves with nerves not or very faintly visible when dry:—			

Flowers minute; corolla rarely over 15 in. in diameter; pedicels filiform:--

Leaves lanceolate, margins only slightly recurved .. 19. H. parviflora. Leaves ovate or ovate-lanceolate, margins very strongly recurved 20. H. revoluta.

Flowers moderate-sized; corolla '4 in. broad; pedicels thick, broadly flattened when dry; leaf-margins slightly

recurved 21. H. plicata.

Corolla rotate-campanulate; lobes very short, broader than long; corona-processes with lower lobes spreading, upper erect (Sect. V. Cystidianthus):—

not or scarcely visible; slender, rooting all along the stems . 23. H. Wrayi.

1. Hoya Multiflora, Blume Cat. Hort. Buit. 49 (1823), and Bijdr. 1064. An epiphytic undershrub, rooting from the branches on the bark of trees; branches stout, smooth, pale, glabrous. Leaves coriaceous, membranous when dry; oblong or oblong-lanceolate, acuminate at apex, acute at base; both surfaces glabrous, more or less shining; margins reflexed; 3 to 8 in. long, 1 to 2 in. broad; midrib stout, raised beneath when dry; main nerves 7 to 10 pairs, the lowest pair faint, close to the margin, the rest curving upwards to and along the margin where they join in loops: secondary nerves few or none; reticulations transverse, irregular, netted, more obvious on the upper surface; petiole stout, 5 to 75 in. long. Umbels racemose, many-flowered (40 to 50), on a stout tubercular bracteate nearly globose rachis at the end of an interpetiolar peduncle; peduncle stout, 1 to 2 in. long; pedicels slender, 1.5 to 2 in. long; flowers white tipped with yellow or yellow tipped with brown, with waxy-white corona. Calyx membranous, cleft about two-thirds down; lobes oblong, 075 in. long; scales rounded, flattened. Corolla rotate, completely reflexed when open; tube minutely bearded at base, 2 in. long; lobes triangular, 25 in. long, with small folds in the sinuses. Corona of 5 horny glabrous processes, with erect upper lobes, conical, longer than the anthers and a horizontal or upcurved horn-like lower lobe at the base, each about 15 to 2 in. long. Staminal-column 3 in. long, stipitate; anthers erect or slightly inflexed; appendages very small, inflexed; pollen-masses oblong, 05 in. long, with a narrow thin outer margin, attached by short cup-like caudicles to the narrow usually clavate pollen-carriers. Style-apex conical-apiculate at tip. Follicle 1, slender, pendulous, 7 to 8 in. long, 3 in. broad; pericarp thin, smooth. Seeds small, oblong, 25 in. long, narrowly winged above on both sides, broadly truncate, with a 2 in. long white silky coma; testa very thin, brown;

cotyledons oblong, 0.75 in. long; radicle cylindric, '05 in. long. Hook. f. Fl. Br. Ind. IV. 52. H. coriacea, Lindl. Bot. Reg. 1839, t. 18, not of Blume. Cyrtoceras multiflorum, Benn. in Herb. Horsf.; Miq. Fl. Ind. Bat. II. 514. Cyrtoceras reflexum, Benn. in Horsf. Pl. Jav. Rar. 90, t. 21; Ridley in Trans. Linn. Soc. Ser. 2, III. 321. C. floribundum, Maund Botanist, IV. t. 178. Centrostemma multiflorum, Dene. in Ann. Sc. Nat. Ser. 2, IX. 272, and in DC. Prodr. VIII. 634; Blume Mus. Bot. Lugd.-Bat. I. 45; Hassk. Flor. Bot. Zeit. IX. (1845) 250; Bot. Mag. t. 5173. C. Lindleyanum, Dene. in.DC. l. c.

Penang: (drawing in Herb. Kew); at Gunong Pulai, 1800 ft., G. King. Perak: at Tea Gardens, Curtis; at Gunong Kelidang, Ridley 9739; at Birjay Malacca, and Gunong Haram Paroh, Scortechini 635, 1905; on tree branches in forest, 1000 to 3000 ft., King's Collector (Kunstler) 2423, 7297. Malacca: on Mount Ophir, Maingay (K.D.) 1123.—Distrib. Burma (Boronga Island, Arracan, Kurz), Java, Borneo, Philippine Islands.

2. HOYA LASIANTHA, Korthals in Mig. Fl. Ind. Bat. II. 526 (1856). A climbing and perhaps epiphytic undershrub; branchlets rather stout, smooth, yellowish when dry. Leaves thinly fleshy when fresh, chartaceous when dry; elliptic or lanceolate, cuspidate-acuminate at apex, acute or rounded at base; both surfaces glabrous, upper shining; margins slightly recurved; 4 to 6 in. long, 1 to 2.5 in. broad; midrib slender, impressed above, raised beneath, with a small pit or gland just above the petiole; main nerves prominent, impressed above, 8 to 10 pairs, at an angle of 50° to 60° with the midrib, curving upwards to and along the margin, the upper ones forming a looped intramarginal nerve; reticulations netted, most prominent on the upper surface; petiole stout, ·5 to ·75 in. long. Umbels 8- to 12-flowered, on short tubercular rachises at the ends of stout axillary or lateral peduncles 1 to 3 in. long; pedicels slender, 1.5 to 2 in. long, glabrous; flowers orange-yellow with white soft hairs, the corona ochreous-yellow, shining. Calyx membranous, hyaline with dark nerves; lobes ovate to nearly orbicular; scales subulate. Corolla about 8 in. broad when spread open; tube very short; lobes lanceolate-acuminate, densely white-villous at their base, recurved in flower. Corona of 5 shining processes, horny when dry, adnate to the lower part of the anthers; the lower lobe ovoid, somewhat laterally flattened, inflated, cleft beneath into two wings; the upper also erect, tongue-like, rounded. Staminal-column moderately long; anthers closely appressed to the upper lobe of the corona, cells slightly divergent; appendages scarious, broad, obtuse; pollen-masses rather long, waxy, flattened, oblong, attached by short, rather thick, cup-like caudicles to the conical pollen-carriers. Style-apex 5-angled, tip conical, acuminate. Follicle 1, slender, 7 in. long, about '25 in. broad, nearly horizontal; pericarp thin, striate. Seeds '2 in. long, elliptic with a short neck, truncate at tip, bearing a white silky coma 1.5 in. long; cotyledons fleshy, elliptic, '1 in. long; radicle cylindric, '05 in. long. N. E. Brown in Gard. Chron. XVIII. 333 (1882), fig. 57. Plocostemma lasianthum, Blume in Rumph. IV. 30, and Mus. Bot. Lugd.-Bat. I. 60, t. XIV.; Bot. Mag. t. 5081.

PERAK: Scortechini 605. SELANGOR: at Semeniyeh, Goodenough for Ridley 8194.—DISTRIB. Java, Borneo (Korthals).

The cultivated specimen imported from Borneo, represented in Bot. Mag. t. 5081, and that collected by Curtis at Wyncoop's Bay, Java, and figured by N. E. Brown in the 'Gardeners' Chronicle,' appear to differ somewhat from the Malay Peninsula specimens in having larger leaves cordate at the base and rather larger flowers. But we fail to find any difference in the structure of the flowers. Another Java specimen (Curtis No. 61) which was sent to Messrs. Veitch & Co., agrees well with the Peninsular plants.

3. HOYA CURTISH, King & Gamble, n. sp. A twining small epiphytic undershrub, rooting at almost all the nodes on the bark of trees or on rocks; branchlets slender, pubescent. Leaves sessile, very thick; orbicular, abruptly triangular-acuminate at apex, rounded or sometimes very slightly attenuate at base; both surfaces scabrous-puncticulate when dry; margin thickened; '4 to '7 in. long, '4 to '6 in. broad; midrib when dry faint, other nerves invisible; petiole none. Umbels sessile, terminal or axillary, 10- to 16-flowered, on a 25 in. long tubercular rachis; pedicels slender, pubescent, 75 to 1 in. long; flowers rather large. Calyx with very short tube or almost none; lobes oblong, ciliate, villous without, membranous, 1 in. long, much recurved; scales minute. Corolla also much recurved; tube very short, with an annular spreading ring (or corolline corona?) a little above the base; lobes spathulate, acute at the tip, minutely scurfy-puberulous, 25 in. long. Corona: corolline (see above), annular; staminal, of 5 cucullate processes nearly globose when closed, but formed of 3 lobes, the two side ones rounded, the upper ovate, the three enclosing a cavity, and the whole corona much overtopping the staminal-column. Staminal-column short and shortly stipitate, attached at the base of the corolla-tube; anther-cells much divergent; appendages ovate, membranous, dentate; pollenmasses oblong-obtuse, about 03 in. long, attached by oblong fleshy thick caudicles to the conical pollen-carriers. Style-apex shortly 5-angled, somewhat depressed; tip bifid, very short. Fruit not known.

PERAK: at Waterloo, 2000 ft., Curtis 2894.

4. Hoya obtusifolia, Wight Contrib. 38 (1834). A climbing (epiphytic?) shrub, with stout fleshy branches reaching 5 in. in diameter

and smooth puberulous bark. Leaves very thick, fleshy; oblong, rounded or emarginate and usually apiculate at apex, rounded or cordate at base; both surfaces shining, glabrous except on the midrib; margins recurved; 4 to 6 in. long, 2 to 3 in. broad; midrib very thick, channelled and pubescent above, raised and glabrous or puberulous beneath; nerves visible only when dry and then main nerves seen to be nearly horizontal, about 10 to 12 pairs, soon branching; petiole very thick, 5 to 1 in. long, puberulous. Umbels many-flowered, racemose, on thick tubercular rachises 5 to 75 in. long and up to about 4 in. in diam., at the ends of thick 1 to 3 in. long puberulous peduncles which are apparently lateral; pedicels rather thick, 1 to 1.5 in. long, puberulous, slightly enlarged below the calyx and dotted; buds 5-angled, acute at tip, 4 in. long; flowers dull yellow. Calyx fleshy; lobes linear-oblong, obtuse, recurved, 15 in. long, dotted and pubescent with-Corolla nearly 1 in. in diam. when open, pubescent without, glabrous within; lobes ovate-cordate-acuminate, generally erect, 4 in. long. Corona of 5 processes; the lower lobe suberect, obtuse, inflated, concave above and channelled beneath; the upper erect, longer than the anthers, acuminate. Staminal-column short; anther-cells parallel with small divergent wings below; appendages membranous, erect, acute; pollen-masses oblong, rounded, thin on the outer margin, attached by rather long curved caudicles to the rather large conical pollen-carriers. Style-apex obscurely 5-angled, obconical, long-apiculate. Fruit not known. Wall. Cat. 8167; Dene. in DC. Prodr. VIII. 638; Hook. f. Fl. Br. Ind. IV. 58. H. Teysmanniana, Mig. Fl. Ind. Bat. II. 522.

Penang: ? Wallich 8167. Perak: Scortechini. Pahang: Ridley 2732. Singapore: at Serangoon, on mangrove trees, Ridley 8932.—Distrib. Tenasserim or Andaman Islands (Helfer 3790), Sumatra (Teysmann 1170), Java.

The colour of the flowers seems to be a little in doubt. Teysmann gives it as "white," the Fl. Br. Ind. says "dull yellow," Ridley says "white with a red centre." It would seem therefore probable that the corolla is white turning yellow and the corona red.

5. Hoya imperialis, Lindl. in Bot. Reg. (1846) under t. 68, in note, and in Journ. Hort. Soc. V. 80 with woodcut (1850). A stout climbing shrub, rooting on trees and probably epiphytic; branches rounded, dark green, puberulous, puncticulate and with papery bark when dry, reaching 5 in in diam. Leaves fleshy or coriaceous, membranous when dry; elliptic or elliptic-oblong, obtuse or shortly acuminate or apiculate at apex, rounded at base or slightly cordate; both surfaces shining when dry,

glabrous above, puberulous or glabrate beneath; margins slightly recurved; 6 to 9 in. long, 1.5 to 2.5 in. broad; midrib stout and broad, pubescent on both sides; main nerves many, more than 12, but difficult to enumerate, nearly horizontal, at first straight, then branching and anastomosing; petiole 25 to 5 in. long, stout, pubescent. Umbels many-flowered (about 10), on short, often strongly tubercular and cushioned; rachises at the ends of stout pubescent axillary peduncles 3 to 10 in. long; pedicels stout, pubescent, 2 to 3 in. long; buds large, rounded above, produced below in 5 short recurved angles; flowers with corolla dark purplish-brown above, cinnamomeous beneath, the corona white or pale yellow. Calyx membranous, puberulous without, scurfy within; lobes ovate-ciliate, 2 in. long; scales minute, triangular. Corolla leathery, 2 to 3 in. in diam.; the puberulous tube a little shorter than the ovate-triangular acute lobes, which are at first much incurved, afterwards spreading. Corona of 5 laterally compressed processes; the lower lobes erect, obtuse, deeply 2-cleft and pubescent in the clefts; the upper lobes also erect-subulate-acuminate. Staminal-column short, broad; anther-cells broad; appendages membranous, broadly winged, acuminate; pollen-masses flattened, oblong, truncate at both ends, 075 in. long, attached by short slender caudicles to the thick, trigonous, horny, brown pollen-carriers. Style-apex pentagonal, the angles rounded below, ridged above, the ridges joining in an acuminate cone. Follicle 1, lanceolate-acuminate, 8 to 9 in. long, 1 in. broad; pericarp leathery, opening flat, at first puberulous, afterwards glabrous, striate when dry. Seeds obovate, flask-shaped, 2 in. long, trigonous above, truncate at tip and bearing a silky white coma 2 in, long; testa corky, pale brown; albumen copious; cotyledons thick, ovate, cordate at base, 1 in. long; radicle 075 in. long, thick. Hook. Bot. Mag. t. 3397, copied in Fl. des Serres IV. tt. 393, 394; Ann. de Gand (1848) t. 228; Jour. Hort. Ser. 3, XXV. 485; Mig. Fl. Ind. Bat. II. 527; Hook. f. Fl. Br. Ind. IV. 59. H. splendens, Maingay MS. Asclepias Sassuela, Roxb. Fl. Ind. II. 31 (excl. syn.)?

MALACCA: Maingay (K.D.) 1135.—DISTRIB. Borneo (Beccari 4001, Motley 1041).

6. Hova elliptica, Hook f. in Fl. Br. Ind. IV. 58 (1883). A slender twining undershrub; branchlets pale, terete, glabrous. *Leaves* fleshy (?) when fresh, chartaceous when dry; elliptic, obtuse both at apex and base; glabrous on both surfaces and pale, especially beneath; margin hardened, nerve-like, slightly recurved; 1.5 to 2.5 in. long, 1 to 1.5 in. broad; nerves prominent when dry; midrib slender; main nerves nearly at right angles to the midrib, irregular, 8 to 10 pairs, straight to join a prominent intramarginal looped nerve at 1 to 15 in. from the

edge, the said intramarginal nerve connected by many cross-nerves with the hardened marginal nerve; reticulations netted; petiole ·15 to ·25 in. long, flattened. Umbels racemose, about 8- to 10-flowered, on a short tubercular rachis at the end of a thickened pink peduncle reaching 1 in. in length; pedicels slender, 1 to 1.5 in. long, puberulous; buds 25 in. long, 5-angled, the incurved valvate corolla-lobes forming a central concavity; flowers "white" (Maingay), nearly black when dry. Calyx puberulous, pale pink; tube very short; lobes ovate-oblong, obtuse, ·05 in. long; scales minute. Corolla ·5 in. broad when open, glabrous without, sparingly pilose within; lobes obcordate, apiculate, inflexed (when dry). Corona of 5 processes; the lower and large lobes suberect, laterally compressed, bladder-like (the interior of the cavity delicately hairy), ovate, slightly apiculate; the upper short, flattened, slightly recurved, appressed to and covering the anther. Staminal-column attached to the base of the corolla-tube; anthers short, much inflexed so as to lie nearly horizontal; cells parallel above, divergent and empty below; appendages scarious, acute; pollen-masses oblong-falcate, pellucid on the outer margin, nearly horizontal, attached by thickened caudicles to the rather large elongate pollen-carriers which are obtuse above and 2-winged below. Style-apex 5-angled, flattened, with a short central umbo having 5 divergent rays to the angles. Fruit not known.

Perak: Scortechini. Malacca: Maingay (K.D.) 1137.

7. HOYA CORONARIA, Blume Bijd. 1063 (1825), and Rumph. IV. 31, t. 182, fig. 2 and t. 184 (fruit). A stout twining shrub, the upper branches giving out roots on to the bark of trees and probably therefore more or less epiphytic; branches thick, velvety pubescent, the innovations especially so. Leaves thickly coriaceous; elliptic elliptic-ovate or ovate-oblong, shortly acuminate at apex, rounded at base; upper surface when dry shining, wrinkled, puberulous especially on the midrib; lower surface pale brown, velvety-pubescent; margins strongly recurved; 3 to 4 in. long, 1 to 2 in. broad; midrib stout, impressed above, raised beneath; main nerves very obscure, about 5 to 7 pairs, nearly horizontal; reticulations not visible; petiole thick, velvety, 25 to '75 in. long. Umbels racemose, rather few-flowered, on thick rachises with large rounded tubercles 5 to 1.5 in. long, at the ends of thick lateral velvety peduncles 5 to 75 in. long; pedicels velvety, curved, thick, 5 to 1 in. long; buds depressed at top, the lobes decurved in a hook; flowers large, fleshy, about 1.5 in. in diam., greenish-white changing to ivory-white, then apparently to pink which darkens and becomes speckled with purple (Ridley); the corona white. Calyx thick, velvety without; lobes orbicular, 15 to 25 in. long; scales subulate. Corolla very thick, glabrous within, villous without; lobes triangular-

acuminate, cordate at base, ·4 in. long. Corona of 5 spreading processes, horny when dry; the lower lobe nearly hemispherical, concave above, convex beneath, about 25 in. long; the upper acuminate, curved far over the anthers. Staminal-column short, thick, inserted at the base of the corolla-tube; anthers incurved, their cells parallel above, divaricate and empty below; appendages prominent, scarious, ovate-acute; pollenmasses broadly clavate, attached by means of long slender twisted caudicles to the rather large pollen-carriers which are rounded above and bifid below. Style-apex circular, saucer-shaped, with a small central umbo and 5 slender rays. Follicle 1, 6 to 10 in. long, 1.5 to .2 in. in diam., gibbous at base, subcylindric above, ending in an obtuse point; pericarp very thick, puberulous, striate; the endocarp woody and smooth; the follicle at length opening nearly flat. Seeds obovate, 4 in. long, truncate at tip and bearing a copious white silky coma 2 to 2.5 in. long; cotyledons elliptic, 2 in. long, fleshy; radicle cylindric, 1 in. long. Miq. Fl. Ind. Bat. II. 517; Hook. f. Fl. Br. Ind. IV. 58; Ridley in Trans. Linn. Soc. 2nd Ser. III. 321. H. grandiflora, Bl. MSS.; Dene. in DC. Prodr. VIII. 635. H. velutina, Wight Contrib. 35; Wall. Cat. 8150; Done. l.c.

Penang: ? Wallich 8150 (marked "Sillet," but probably in error); Curtis 236. Dindings: Curtis; Scortechini 1053. Perak: at Goping, Scortechini 2009; at Matang, on sea coast, Wray 2710; at Larút, Kunstler 3865 (leaves only); King's Collector 4116, 6954. Malacca: Griffith 3788; Maingay (K.D.) 1125. Pahang: at Kwala Pahang, Ridley. Singapore: at Serangoon, Ridley 2731a.—Distrib. Java, Sumatra (Teysmann 1171), Borneo (Motley 871, Burbidge), Celebes, New Guinea (H. O. Forbes 516, flowers 2 in. in diam.).

We have not quoted Hook. Bot. Mag. 4969, which in some respects seems to represent more nearly *H. obtusifolia* rather than this. As in other species, the colour of the flower is either very variable or in doubt. Low's drawing in Herb. Kew shows pink flowers, while Scortechini says they are white, Kunstler and Wray that they are "very pale yellow," and Maingay that they are "white or yellowish with purple spots."

8. Hoya Scortechini, King & Gamble, n. sp. An epiphytic undershrub, rooting at intervals on the bark of trees; branchlets slender, terete, pale brown. *Leaves* thick, fleshy, drying coriaceous; ovate or ovate-lanceolate, acuminate at apex, rounded or cordate at base; both surfaces glabrous, lower minutely glandular; margins recurved; 2 to 3.5 in. long, .75 to 1.25 in. broad; nerves only visible when dry; midrib thick; main nerves 5 to 6 pairs at an angle of 50° to 60° with the midrib, branching early and anastomosing near the margin; reticulations transverse; petiole stout, .2 in. long. *Umbels* apparently few-flowered,

on stout (·25 in.) rachises with small tubercles at the ends of rather long (1·5 to 4 in.) slender peduncles; pedicels slender, ·5 to ·75 in. long; buds hemispheric, 5-angled, flattened above, ·25 in. in diam. Calyx small; lobes ovate, ciliate, membranous, glandular, recurved, ·03 in. long. Corolla ·5 to ·6 in. in diam. when open, glabrous without, puberulous within; lobes ovate-acuminate, ·2 in. long. Corona of 5 processes more or less upturned; lower lobes ovate, thick, very obtuse at tip, with a raised ovate ring above and deeply cleft valves below; upper lobe shorter than the anthers, erect, acute. Staminal-column short; anthercells slightly divergent; appendages scarious, acuminate; pollen-masses thick, oblong, straight on inner side, attached by short caudicles embracing their base to the rather large conical pollen-carrier. Style-apex 5-lobed, acute at tip. Follicles (immature) 1 or 2, very slender, narrow; pericarp very thin, smooth. Seeds small, oblong, truncate at tip with a ·75 in. long coma.

PENANG: John Scott. PERAK: Scortechini 464, 1557.

John Scott's specimen has rather thinner leaves, but this is probably only due to youth. His specimen bears no flowers, only young fruit, so we think it best not to couple his name with the species.

9. HOYA CAUDATA, Hook. f. Fl. Br. Ind. IV. 60 (1883). A twining epiphytic shrub, rooting on trees; branches 1 to 2 in. thick, with corky rugose bark. Leaves thick, fleshy, coriaceous when dry; ovate, acuminate at apex, rounded or cordate at base; both surfaces glabrous, sparsely papillose; margins corrugate and recurved; 3 to 7 in. long, 2 to 3 in. broad; midrib slender; main nerves 3 to 4 pairs, distant, arching, very faint; reticulations not visible; petiole up to 25 in. long, very thick, so thick as to appear globose. Umbels many-flowered on a ·5 to 1 in. long tuberculate rachis at the end of a thickened 1 in. long peduncle; pedicels 5 in. long, filiform; flowers white suffused with pink. Calyx very membranous; lobes linear-lanceolate, glabrous, 05 to ·075 in. long. Corolla ·5 to ·75 in. in diam.; lobes ovate, long caudateacuminate, silvery-pilose within. Corona fleshy; lower lobes horizontal. elliptic-ovate, the broadest end outwards, concave above; the upper lobe produced in a long erect subulate spur shorter than the anthertips. Staminal-column short; anther-wings straight; appendages membranous, long caudate-acuminate; pollen-masses flattened, oblong, truncate, attached by cup-shaped broad caudicles to the rather narrowly ovate brown pollen-carrier. Style-apex 5-angled, with a short conical tip.

MALACCA: Maingay (K.D.) 1128.

10. HOYA LATIFOLIA, G. Don Gen. Hist. Dichl. Pl. IV. 127 (1838).

A climbing (probably epiphytic) shrub; branches very stout, smooth, lenticellate, giving out slender rootlets occasionally. Leaves very thick, fleshy; ovate or oblong-ovate, acute at apex, rounded or cordate at base often slightly peltate; glabrous on both surfaces, dull when dry; margins strongly recurved, shining; 5 to 10 in. long, 3 to 7 in. broad; midrib with a gland at the base; nerves 3 to 5 from the base, connected at intervals by few irregular cross-nerves; reticulations not otherwise visible; petiole very stout, 25 to 5 in. long, articulated to a thick shining cup-like base at the node. Umbels racemose, on thick, pitted. up to 1 in. long, tubercular rachises at the end of stout 1 to 2 in. long peduncles, which are solitary or fascicled in the leaf-axils or at the nodes of very long (sometimes 5 ft.!) flowering branches; pedicels very slender, puberulous, 25 in. long; buds flattened, 5-angular; flowers very small, grey, 35 in. broad when open, 15 with the lobes closed. Calyx minute, membranous; lobes ovate, acute, 3 in. long. Corolla small, rotate, pubescent within; lobes ovate, at first incurved over the staminal-column, afterwards spreading. Corona of 5 membranous processes, each consisting of an ovate lower horizontal or slightly upcurved lobe concave above and deeply grooved below, the tip apiculate recurved, and an upper shorter erect lobe with acute tip and a channel behind. Staminal-column very short; anther-cells divergent; appendages membranous, acute; pollen-masses oblong-falcate, pellucid on the outer margin, attached by short thick caudicles to the rather large 3-lobed pollen-carriers. Style-apex sharply 5-angled, conical-apiculate. Follicle 1, very slender, 4 to 4.5 in. long, 2 in. broad; pericarp thin, puberulous. Seeds oblong, acute at base, truncate at tip, 25 in. long, bearing a white silky coma 1 to 1.25 in. long; cotyledons thick, ovateoblong, 1 in. long; radicle as long and broad as cotyledons, flattened. Dene. in DC. Prodr. VIII. 638; Mig. Fl. Ind. Bat. II. 521; Hook. f. Fl. Br. Ind. IV. 57. H. macrophylla, Wight Contrib. 38, not of Blume. H. polystachya, Blume Mus. Bot. Lugd-Bat. I. 45, t. 9; Miq. l. c. 522.

Penang: Wallich 8165a. Pahang: Kota Glarggi woods, Ridley in Trans. Linn. Soc. Ser. 2, III. 321. Singapore: Maingay (K.D.) 1124; Lobb; Hullett 621; at Cluney Road, Goodenough 2734—Distrib. Java, Sumatra.

11. Hoya lacunosa, Blume Bijdr. 1063 (1825). A creeping epiphytic undershrub, rooting at the nodes; branchlets very slender, glabrous. Leaves very thick, fleshy; ovate, ovate-lanceolate or lanceolate, acute or acuminate at apex, rounded or attenuate at base; both surfaces glabrous, shining; margins thickened; .75 to 1.75 in. long, .5 to .75 in. broad; midrib when dry faint, usually glandular at the base; main nerves 2 to

4 pairs, also faint but visible, at right angles to the midrib, straight to join an intramarginal nerve covered by the marginal thickening; petiole thick, very short. Umbels axillary, on stout peduncles .75 to 1.5 in. long, which end in a thickened rachis of cushion-like bracts often 25 in. long; pedicels slender, 25 to 35 in. long; buds globose; flowers white, usually tinged with vellow, scented. Calyx rotate, membranous; lobes as long as tube, 025 in. long, obtuse; scales minute. Corolla 25 in. in diam. when spread out, pubescent or scurfy within; lobes triangular, recurved. Corona membranous, of 5 processes, forming a concavesided cone, the lower lobe of each process spreading or upcurved, ovate, the upper lobe ovate-acute, exceeding the anther. Staminal-column short; anthers minute with very thin membranous acute appendages; pollen-masses oblong-falcate, reticulate, compressed, attached by erect thickened cup-shaped caudicles to the small pollen-carriers. Style-apex rather deeply lobed; tip conical. Follicles smooth. Done. in DC. Prodr. VIII. 638; Hassk. Cat. Bogor. 126, and Flora Bot. Zeit. (1845) 280; Mig. Fl. Ind. Bat. II. 525; Hook. Bot. Mag. 4826, 5272; Hook. f. Fl. Br. Ind. IV. 55. Otostemma lacunosum, Blume Rumph. IV. 30, t. 184, fig. 2 and Mus. Bot. Lugd.-Bat. I. 59, t. 11.

Penang: Michado for Curtis. Perak: Scortechini 1558; King's Collector 3476. Malacca: Maingay (K.D.) 1133 (part). Selangor: at Rawang, Ridley 7569.—Distrib. Sumatra, Java, Borneo.

12. Hoya diversifolia, Blume Bijdr. 1064 (1826). A climbing glabrous shrub; branches flexuous, smooth, brown; branchlets paler; the bark very thin. Leaves fleshy, very thick; broadly elliptic or obovate, obtuse or apiculate at apex, rounded at base; both surfaces glabrous, dull; margins recurved; 2 to 4 in. long, 1.5 to 2.5 in. broad; nerves only visible when dry, midrib broad; main nerves about 4 to 6 pairs, rather irregular, at about 60° with the midrib, soon branching; reticulations very indistinct; petiole .25 to .5 in. long, thick. Umbels many-flowered, on stout thick 25 to 75 in. long tubercular rachises at the ends of very thick 5 to 2.5 in. long peduncles, which are lateral one to each pair of leaves; pedicels slender, 5 in. long; buds flattened with 5 rounded angles; flowers 25 to 35 in. broad, white or rose-coloured with pink corona (yellowish-white (Maingay)). Calyx membranous; lobes elliptic-obtuse, usually ciliate at the tips, .075 in. long; scales apparently none. Corolla glabrous without, puberulous within; lobes cordate-acuminate. Corona of 5 processes attached to the bases both of the staminal-column and of the corolla-tube; lower lobe of each process orbicular or ovate, concave above and with a small central boss, 2-winged below, the wings connivent; upper lobe erect, triangular-acute, shorter than the anther-appendages. Staminal-column very short;

anther-cells parallel above, divergent and empty below; appendages scarious, acute or acuminate; pollen-masses oblong, truncate at top, thin on the outer margin, attached by very short thick caudicles to the rather long obconical pollen-carriers. Style-apex 5-angled, depressed, with a short conical apiculus. Follicles sublinear, falcate, 6 in. long, ·75 in. broad; pericarp thick, apparently ·25 in. or more. Seeds oblong, ·25 in. long. Dene. in DC. Prodr. VIII. 636; Miq. Fl. Ind. Bat. II. 518; Hook. f. Fl. Br. Ind. IV. 61. H. orbiculata, Wall. in Wight Contrib. 36; Wall. Cat. 8151; Dene. l. c. 635; Miq. l. c. 519. "Sussuela esculenta," Rumph. Herb. Amb. V. 467, t. 175, f. z.

Penang: at Pulau Boetong, Curtis 928. Perak: Wray 2718; Scortechini 118. Malacca: Griffith 3787; Maingay (K.D.) 1130. Pahang: at Pekan, Ridley 1619. Singapore: Ridley 1626, 2733—Distrib. Burma (at Prome, Wallich 8151), Java, Amboyna.

13. Hoya Maingayi, Hook. f. in Fl. Br. Ind. IV. 62 (1883). A trailing epiphytic shrub, sending out rootlets along its stem; nodes much swollen; branches stout; branchlets terete, pale brown. Leaves very thick, fleshy, coriaceous when dry; elliptic-lanceolate or oblanceolate, shortly acuminate at apex, long acuminately narrowed at base; both surfaces glabrous, dull when dry; margins recurved; 7 to 9 in. long, 2.5 to 3.5 in. broad; midrib slender but prominent when dry, with a gland or enlargement at the base above the petiole; main nerves about 5 pairs, prominent when dry, especially above, at about 60° to 70° with the midrib, nearly straight at first, then branching and forming a rough intramarginal nerve; secondary nerves few; reticulations irregular, distant; petiole thick, 25 to 5 in. long. Umbels many-flowered (20 to 30), on a very short tubercular rachis at the end of a thick peduncle 3 to 1 in. long; pedicels very slender, 5 to 1 in. long; buds obconical, pentagonal, concave above, 25 in. broad; flowers pale pink; corona white. Calyx small, pale pink with red tips, red-scabrous-punctate without, glabrous within; lobes 03 in. long, obtuse, ciliate; no scales. Corolla 5 to 75 in. broad when open; lobes triangular, villous within with pale crispate hairs. Corona of 5 processes; outer lobe ovate, acute, horizontal, bi-cleft, concave above with central ridge, 2-valved below; upper of a short acute tooth shorter than the anther-tip. Staminalcolumn short, attached at the base of the corolla-tube; anther-cells divergent; appendages scarious, acuminate, incurved; pollen-masses flattened, oblong-falcate, waxy, attached by short caudicles embracing their bases to the conical pollen-carriers. Style-apex 5-angled, angles acute, tip conical. Fruit not known in the ripe state, when immature 4 to 5 in. long, 25 in. broad, acuminate, tip recurved; pericarp smooth.

Perak: Scortechini 584. Malacca: Maingay (K.D.) 1136.

14. HOYA PARASITICA. Wall. in Wight Contrib. 37 (1834), and Cat. 8159. A stout climbing epiphytic shrub, creeping over the trunks and branches of trees and giving off roots from every part (Roxb.); branches smooth, pale, fleshy. Leaves fleshy, thick, very variable; ovate or elliptic or lanceolate, acute or acuminate at apex, rounded or almost cordate to cuneate at base; glabrous on both surfaces; margins recurved: 3 to 7 in. long. 1.5 to 3 in. broad: 5-nerved from the base. the outermost pair thin, forming loops near the margins, from the sinuses of which transverse nerves join them to the middle pair: midrib with several transverse nerves also joining the middle pair, which have one or two loops near the tip, all raised on both surfaces when dry, as are the other irregular reticulations; petiole very thick, 25 to 1 in. long. Umbels many-flowered, racemose, on short or long (reaching 4 in.). thick (often nearly 25 in. in diam.), tubercular rachises at the ends of stout 1 to 3 in. long axillary or lateral peduncles which are solitary or in pairs; pedicels slender, 5 in. long or longer; buds turbinate, 5-angled; flowers pearly-white with a pink centre, very fragrant. Calyx membranous; lobes ovate, acute; scales very small. Corolla ·3 in. broad; lobes cordate, glabrous, inflexed, with the corona-processes projecting between them. Corona of 5 membranous 2-lobed processes. which are horny and shining when dry, and white with pink tips; the lower lobes ovate, spreading, grooved beneath; the upper lobes erect, acute. Staminal-column short; anther-cells divergent; appendages membranous, acute; pollen-masses oblong, truncate, thin on the outer margin, attached by short thick caudicles to the conical pollencarriers. Style-apex membranous, 5-angled, conical-apiculate. Fruit not known. Wight Ic. 587; Dene. in DC. Prodr. VIII. 637; Hook. f. Fl. Br. Ind. IV. 57; Prain Beng. Plants 700. H. Hookeriana, Wight Contrib. 37; Wall. Cat. 8153; Done. l. c. 636. Hoya sp., Wall Cat. 8153. H. pallida, Lindl. in Bot. Reg. t. 951; Paxt. Fl. Gard. t. 26. copied in Lemaire Jard. Fleur. t. 64. Asclepias parasitica, Roxb. Hort. Beng. 20, and Fl. Ind. II. 42; Wight Ic. t. 587.

Kedah: Kunstler 1829. Penang: at Waterfall, Curtis. Perak: at Sungie Larut, Wray 2273; at Bake Kuran, Scortechini 1626; at Ulu Bubong, King's Collector 10316. Malacca: Griffith; Maingay (K.D.) 1126, 1132, 1138. Pahang: Praman, near Pekan, Ridley in Trans. Linn. Soc. Ser. 2, III. 321. Singapore: Ridley 1796, 8070.—Distrib. India (Sikkim, Assam, Sundarbans, Chittagong, Andaman Islands).

Kunstler describes the colour of the flowers as "white with a pink centre" or "waxy white with a purplish tinge," but Wray says it is "pale greenish-yellow with a few small spots of crimson." Roxburgh, who had it in cultivation, says the

flowers are "pearl-coloured," and this is what the Fl. Br. Ind. says of the corolla, giving the corona-processes as "white with pink at the junctures." Maingay (MS. Notes IV. p. 41) says, "petals white, faintly greenish towards the tips, corona white." These remarks, for what seems clearly to be the same plant, explain the difference between Lindley's and Paxton's drawings alluded to in the Fl. Br. Ind. As remarked in Fl. Br. Ind., H. cinnamomifolia, Hook. Bot. Mag. 4347, from Java, "has very similar flowers and leaves." But for the corolla being green and the corona purple in that fig., we should be inclined to place it under H. parasitica.

15. Hoya coriacea, Blume Bijdr. 1063 (1826), and Rumph. IV. t. 187. A climbing shrub, nearly glabrous; branches shining, smooth, angled when dry; branchlets pubescent. Leaves coriaceous (Blume) or fleshy (Wight), chartaceous when dry; ovate or ovate-lanceolate, acute or acuminate at apex, rounded at base; glabrous and more or less shining on both surfaces; margins slightly recurved; 3 to 6 in. long, 1 to 2.5 in. broad; midrib slender, raised on the lower surface, sometimes with one or more glands just above the petiole; main nerves distinct, 4 to 6 pairs, at about 40° to 50° with the midrib, straight and then branching and anastomosing with a looped intramarginal nerve; reticulations netted, prominent; petiole slender in young leaves, thick in old ones, 25 to 75 in. long. Umbels racemose, many-flowered (30 to 40), on stout tubercular rachises .25 to .75 in. long and .15 to .2 in. thick at the ends of stout lateral puberulous peduncles 2 to 5 in. long; pedicels slender, .75 to 1.25 in. long; buds flattened, 5-angled, .5 in. broad, 15 in. high; flowers straw-coloured, yellow or reddish, the corona white. Calyx pubescent without; tube short; lobes linear, sparsely ciliate, 15 in. long; scales minute. Corolla .75 in. in diam. when expanded; lobes triangular-ovate, acuminate, villous within and grey when dry ("hairs like collapsed hollow tubes"-Wight), at first incurved over the column, at last recurved. Corona of 5 spreading processes, shining and horny when dry: lower lobes ovoid, acute, inflated, 2-winged below with the wings connivent; upper lobes erect, acute, connivent with but shorter than the anthers. Staminal-column short; anther-cells parallel above with divergent empty ones below; appendages scarious, ovate-acute; pollen-masses slender, oblong-falcate, straight and thickened on the inner edge, attached by spathulate caudicles with a raised margin above to the very narrow slender pollencarriers. Style-apex 5-angled, rather thick, depressed above with a small umbo. Follicle 1, 4.5 to 5 in. long, 5 to 75 in. broad, lanceolate, obtusely beaked; pericarp very thick, woody, rugose. Seeds oblanceolate, thick, 25 in. long, truncate at tip and bearing a silky coma 1.25 in. long; cotyledons elliptic, fleshy, 15 in. long; radicle cylindric, ·075 in. long Mus.Bot.Lugd.-Bat. I. 44; Miq. Fl. Ind. Bat. II. 521; Done. in DC. Prodr. VIII. 638; Bot. Mag. t. 4518, copied in Fl. des Serres t. 578; Paxt. Fl. Gard. I. 77, fig. 55; Lemaire Jard. Fleur. t 37 Hook. f. Fl. Br. Ind. VI. 61; Schum. in Engl. & Prantl Pflanzenfam. IV. 2, 290, fig. 88 A, B. H. Brunoniana, Wight Contrib. 37; Wall. Cat. 8163; Dene. l. c. 636.

Perak: Scortechini 533. Malacca: Griffith; Maingay (K.D.) 1131, 1134. Pahang: at Pekan, Ridley 2171.—Distrib. Java, Borneo (Motley 1121; Beccari 3926).

16. HOYA FORBESH, King & Gamble, n. sp. A climbing shrub, rooting on trees and probably epiphytic; branchlets somewhat angular, lenticellate, with pale brown shining bark. Leaves coriaceous when dry; elliptic-oblong or -obovate, shortly and bluntly acuminate at apex, rounded at base; upper surface glabrous, shining; lower surface minutely papillose; both pale brown when dry; margins somewhat recurved; 4 to 7 in. long, 2.5 to 4 in. broad; midrib strong, much raised beneath, bearing on the upper surface a gland just above the petiole; main nerves about 7 pairs, irregular but usually at 40° with the midrib, more or less curved and branching; secondary nerves frequent, especially near the top between the main nerves; reticulations transverse, irregular, clearly visible only on the upper surface; petiole very thick, bent, articulate in the middle, about 5 in. long. Umbels apparently few-flowered, on .75 in. long rachises with small tubercles at the end of short (about '75 in.) peduncles; pedicels filiform, ·5 in. long, puberulous; buds flattened, ·25 in. in diam.; flowers having greyish-white corollas with purple tips (Forbes). Calyx membranous; lobes about twice as long as tube, ovate, ciliate, puberulous without; no scales. Corolla · 4 in. in diam., puberulous without; lobes broadly triangular-ovate-acute, incurved. Corona of 5 inflated processes closely adnate to the staminal-column; lower lobes horizontal, narrowoblong, slightly ridged above, 2-valved below, nearly 1 in. long; upper lobe a minute erect tooth. Staminal-column short; anthers incumbent over the style-apex; cells divergent; appendages acute, scarious; pollenmasses flattened, falcate, attached by short straight caudicles to the narrow pollen-carriers. Style-apex very thin, deeply 5-lobed with a conical tip. Fruit not known.

Perak: Scortechini 1679, 1680. — Distrib. Sumatra, on Kaba Volcano, 5000 feet (Forbes 2896a).

17. Hoya Finlaysonii, Wight Contrib. 38 (1834). A climbing shrub; stem stout; branchlets pale brown, smooth, lenticellate, flexuose. Leaves coriaceous, thick, hard and tough when dry; ovate- or oblong-lanceolate, obtusely acuminate at apex, more or less rounded at base; both surfaces at first minutely papillose, afterwards glabrescent or dotted, when fresh greenish-red above, dark red beneath; margins with

a wavy nerve close to the edge; 5 to 7 in. long, 1.5 to 2.5 in. broad; nerves very prominent and raised on both surfaces when dry; midrib stout, with a large gland just above the petiole; main nerves about 5 to 7 pairs besides the marginal one, at about 60° with the midrib, nearly straight to join a second and prominent looped intramarginal nerve; secondary nerves many, irregular; reticulations irregular, netted; petiole very thick, 25 to 5 in. long. Umbels very manyflowered, without any prominent tubercular rachis; peduncles 75 to 2 in. long, rather slender; pedicels almost capillary, 5 to 75 in. long; buds 5-angled, hemispheric below, flattened and depressed above, 25 in. across; flowers with cream-coloured and pink corolla and waxy-white corona. Calyx thin, nearly hyaline, with a few brown veins; lobes obtuse, 05 in. long, pubescent within. Corolla 4 in. broad when open, pubescent within; lobes triangular-ovate-acute, usually inflexed. Corona of 5 spreading inflated processes; the lower lobes ovate-acute, concave at first, afterwards more or less ridged, 2-winged below; the upper lobe erect, short, acute. Staminal-column short, attached to the top of the corolla-tube; anther-cells divergent; appendages short. rounded, scarious; pollen-masses oblong-falcate, obtuse at tip, attached by very short thick caudicles to the conical pollen-carriers. Style-apex 5-angled, with 5 rays leading to a short apiculus. Follicle 1, very slender, 7.5 in. long, .25 in. broad, straight, acuminate; pericarp thin, glabrous, striate. Seeds cylindric, 3 in. long, acute at base, truncate at tip, and bearing a 1 to 1.5 in. long silky coma; testa very thin, brown; cotyledons fleshy, lanceolate, 15 in. long; radicle cylindric, 1 in. long. Wall. Cat. 8166; Done. in DC. Prodr. VIII. 638; Miq. Fl. Ind. Bat. II. 527; Hook. f. Fl. Br. Ind. IV. 62.

PERAK: Wray 2724; King's Collector 4800. SINGAPORE: Wallich 8166.—DISTRIB. Siam? (Finlayson).

The specimens in the Kew Herbarium have no flowers, but we see no reason to doubt the identification of the leaves of our specimen.

18. Hoya Ridleyi, King & Gamble, n. sp. A twining epiphytic undershrub, rooting at intervals on the bark of trees; branchlets pale, terete, lenticellate, rather slender when dry. Leaves fleshy, coriaceous when dry, variable; ovate or ovate-oblong or oblong-lanceolate, acute at apex, rounded or narrowed or sometimes cuneate at base; both surfaces glabrous; margins recurved; 3 to 5 in. long, 1.25 to 1.75 in. broad; midrib slender, faint, as are the nerves generally, even when dry; main nerves about 5 to 6 pairs, the lowest pair starting from the base and curving along the margin, the others nearly at right angles, quickly branching and joining the marginal one; reticulations irregularly

netted; petiole very thick, '25 to '75 in. long, broad at the junction with the blade. Umbels many-flowered, on '25 to 1 in. long rachises with small tubercles at the ends of stout lateral peduncles 1 to 4 in. long; pedicels slender, '5 to '75 in. long; buds flattened, '25 in. in diam. Calyx papillose without; lobes oblong, acute, '06 in. long; no scales. Corolla rugose without, puberulous within; lobes cordate, almost 3-pointed, points acuminate, especially the end one. Corona of 5 shining inflated processes; lower lobe horizontal, ovate, sharply acute, concave on the upper surface with a median ridge, 2-valved below; upper lobe on acute erect tooth, shorter than the anthers. Staminal-column short, inserted on the tube of the corolla, wings of filaments ear-like; anthercells divaricate; appendages scarious, acuminate, incurved; pollenmasses flattened, oblong, truncate at top; attached by short thick caudicles to the 3-lobed rounded rather large pollen-carriers. Styleapex membranous, 5-angled; tip long conical. Fruit not known.

KEDAH: at Pulau Songsong, Curtis. Penang: Curtis; at Pulau Tikus, Ridley 9476. Perak: at Maxwell's Hill, Ridley 5519. SINGAPORE: at Grange Road, Ridley 10358.

To this species, also, probably belongs *Curtis* 2355 from Kwala Lumpor, Selangor, which has, however, smaller leaves, but no flowers.

19. HOYA PARVIFLORA, Wight Contrib. 37 (1834). A twining, slender, epiphytic undershrub; rooting on the stems and branches of trees; branchlets very slender, terete. Leaves thick, coriaceous; lanceolate, acute both at apex and base; glabrous on both surfaces; margins slightly recurved; 2 to 4 in. long, 35 to 75 in. broad; midrib slender, obscure; main nerves very faint even when dry, 5 to 6 pairs, very acutely (about 10°) spreading from the midrib, the lowest pair even more so; reticulations not visible; petiole about 15 in. long, thick. Umbels many-flowered (30 to 40), racemose, lateral or terminal; peduncle rather stout, 1.5 to 1.75 in. long, ending in a thickened strobilate rachis often 1 in. long with minute imbricate bracts; pedicels slender, 25 to ·5 in. long; buds globose, depressed; flowers many, about ·15 to ·25 in. in diam., apparently white. Calyx membranous, very small; lobes ovate. Corolla rotate, revolute, villous within with unicellular soft hairs; lobes triangular. Coropa of 5 membranous horizontally spreading processes, forming a shallow cone; lobes longitudinally folded, bifid at apex. Staminal-column very short; anthers connivent over the style-apex, with very thin membranous appendages; pollen-masses very minute, flattened, oblong-truncate, attached by minute cup-shaped caudicles to the triangular pollen-carriers. Style-apex with a conical tip. Follicles very slender, 4 to 5.5 in. long, 2 in. broad; pericarp thin,

smooth. Seeds oblong, 25 in. long, not winged, truncate at tip, and bearing a 1 in. long white silky coma; testa very thin, pale brown, smooth; cotyledons oblong, 05 in. long; radicle cylindric, 075 in. long. Wall. Cat. 8156 A; Dene. in DC. Prodr. VIII. 637; Hook. f. Fl. Br. Ind. IV. 54.

Penang: at Balik Pulau, Curtis 689; on Mount Elvira, Md. Haniff for Curtis.—Distrib. Tenasserim (Wallich 8156 A).

20. HOYA REVOLUTA, Wight MS.; Hook, f. in Fl. Br. Ind. IV. 55. (1883). A twining epiphytic undershrub, occasionally rooting from the nodes; branchlets slender, terete, glabrous. Leaves very thick and fleshy; ovate or ovate-lanceolate, acuminate at apex, rather abruptly acute and attenuate at base; both surfaces glabrous, very pale when dry and more or less shining; margins strongly recurved; 1.5 to 3 in. long, 75 to 1 in. broad; midrib and main nerves (3 to 4 pairs at about 60°) only occasionally, and then very faintly, visible when dry; petiole very thick, 1 to 15 in. long. Umbels on a 2 to 4 in. long peduncle, ending in a thick strobilate rachis 5 in. long with cushion-like minute bracts; pedicels of various lengths, 25 to 1 in. long, filiform; buds small, round, depressed, 1 in. in diam.; flowers small, pink, or white with pink tips. Calyx rotate; lobes oblong, obtuse, 02 in, long; scales small, flat. Corolla 125 in. in diam., with a slight raised fold at the mouth of the tube; lobes triangular, as long as tube. Corona of 5 membranous processes united into a conical vertically 5-lobed column, each again lobed and produced upwards in an acute point. Staminalcolumn very shortly stalked; anthers inflexed; appendages acuminate. membranous; pollen-masses oblong, obtuse, attached by short thick caudicles to the small pollen-carriers. Style-apex deeply 5-lobed, with a conical apiculus. Fruit not known. H. ovalifolia, Wall. Cat. 8160B.

Perak: in Larút 3962 and at Relan Tujor, Wray 1902; Scortechini. Malacca: Griffith; Maingay (K.D.) 1127, 1129, 1123 (part). SINGAPORE: Wallich 8160B.

Wray No. 3962, from Blanda, Mabok Plains, Larút, is a fruiting specimen which may possibly belong to H. revoluta, Wight; but the leaves are lanceolate and not ovate, and the flowers are described as yellow instead of pink. The following is the description:—

A climbing undershrub; branches terete, pale brown. Leaves fleshy, coriaceous when dry; lanceolate, acuminate at apex, narrowed at base; glabrous on both surfaces; margins strongly recurved; 1.5 to 2 in. long, 5 to .75 in. broad; midrib and main nerves only very faintly visible when dry, the latter curving upwards at an acute angle; petiole very thick, .25 in. long on a much enlarged base. Flowers not seen. Follicle lanceolate, poniard-shaped, acutely angled, 2.5 in. long, .4 in. broad; pericarp thick. Seeds very small, .1 in. long, trigonous-oblong with a broad truncate apex, bearing a white silky coma 1 to 1.5 in. long; testa thin, brown; albumen rather thick;

cotyledons elliptic, $\cdot 02$ in. long; radicle $\cdot 01$ in. long, flattened perpendicularly to the cotyledons.

21. HOYA PLICATA, King & Gamble, n. sp. A climbing, probably epiphytic, undershrub; branchlets rather stout, terete, yellowish. Leaves fleshy, coriaceous when dry; ovate-lanceolate, acuminate at apex, acute at base; smooth and glabrous on both surfaces; margins slightly recurved; 3 in. long, 1 in. broad; midrib very faint and then only when dry; remaining nerves invisible; petiole stout, 25 in. long, flattened. Umbels many-flowered, racemose, on stout tubercular rachises, 25 to ·5 in long at the ends of stout ·75 to 1 in long peduncles; pedicels fleshy, broadly flattened when dry, 1 in. long; buds 5-angled, flattened. Calyx small; lobes ovate, acuminate, hyaline; scales subulate. Corolla ·4 in. broad, with a raised 5-angled villous ridge in the tube above the insertion of the staminal-column, puberulous on both surfaces; lobes triangular, 1 to 15 in. long. Corona of 5 shining horny processes attached to the backs of the anthers; lower lobe ovate, obtuse or bifid at apex, with a broad fold on the upper surface; upper lobe erect, acuminate, as long as the anthers. Staminal-column short; anther-cells parallel; appendages scarious, acuminate; pollen-masses flattened, granular, thin on the margin, truncate at top, seated on the face of spathulate horizontal caudicles, which connect them with the rather large-lobed pollen-carriers. Style-apex 5-angled, fleshy, with a short conical apiculus. Fruit not known.

Perak: at Maxwell's Hill, 3000 ft., Scortechini 323.

22. Hoya campanulata, Blume Bijdr. 1064 (1825). A small twining shrub; branches fleshy; branchlets pale brown and shining when dry, the bark scaling off. Leaves fleshy and bright-green when fresh, coriaceous when dry; elliptic-oblong, acuminate at apex, cuneate or attenuate, sometimes rounded at base; both surfaces glabrous, more or less shining, pale when dry; margins recurved; 2.5 to 6.5 in. long. 1 to 2.5 in. broad; midrib stout, raised below, impressed above when dry; with a rounded gland at the base above the petiole; main nerves 6 to 7 pairs, straight to meet, often at scarcely more than half-way to the edge, a prominent (when dry) looped intramarginal nerve; secondary nerves few, similar; reticulations many, irregular, prominent, and raised above when dry; petiole 25 in. long, stout. Umbels about 16- to 20flowered; peduncles stout, 1 to 2 in. long, the bracteate portion 25 to 5 in. long; pedicels very slender, 1 to 1.25 in. long; buds globose, depressed; flowers cream-coloured. Calyx-lobes membranous, hyaline, subulate. Corolla glabrous, about 1 to 1.5 in. broad or broader; lobes ciliate, boat-shaped, 6 in. long; scales very short, apiculate. Corona of 5 processes; lower lobes of spreading spurs 15 to 2 in, long,

smooth, shining, horny when dry; upper lobes somewhat similar, erect. Follicles straight, cylindric, '6 to '8 in. long, '2 in. broad; pericarp smooth, green with white stripes when fresh. Seeds oblong, obspathulate, '3 in. long, '1 in. broad, with a short wing at the base, the tip truncate with a white silky coma 1 to 1.5 in. long; testa very thin, smooth; cotyledons oblong, '15 in. long; radicle cylindric, '1 in. long. Wall. Cat. 8171; Dene. in DC. Prodr. VIII. 633; Miq. Fl. Ind. Bat. II. 513; Hook. f. Fl. Br. Ind. IV. 62. H. campanulata, Blume Bijdr. 1064; Lindl. Bot. Reg. (1847) t. 54; Hook. Bot. Mag. t. 4545. Cystidianthus campanulatus, Hassk. Cat. Hort. Bog. 126; Blume Mus. Bot. Lugd.-Bat. I. 57; Miq. l. c. 515. Physostelma Wallichii, Wight Contrib. 40; Wall. Cat. 8171; Dene. in DC. l. c.; Miq. l. c. 513; Hook. f. Fl. Br. Ind. IV. 62. P. ? campanulata, Dene. l. c.

PERAK: at Relan Tujor, Wray 1841, 3139, 4014, 4024; Scortechini 171, 336; at Bujong Malacca, Ridley 9712; King's Collector 2587, 3457, 3819. SINGAPORE: Wallich 8171. — DISTRIB. Sumatra, Java (Forbes 416), Borneo (Haviland 1971).

A specimen of Forbes's from Sumatra has flowers quite twice as large as those from the Peninsula, but the structure is the same. He says, "Flowers cream-white with a flush of rose-purple, very fragrant." The description of the follicles is taken from those sent by Wray with his No. 1841, but as they are not attached to the plant, and we have seen no others for comparison, we do not feel quite sure of their identification.

23. Hoya Wrayi, King & Gamble, n. sp. A slender creeping epiphytic undershrub, rooting on the branches of trees; stems slender, very rough when dry. Leaves fleshy, thinly coriaceous when dry; lanceolate, obtuse and glandular-apiculate at apex, long-attenuate at base; upper surface glabrous smooth, lower minutely papillose, both grevish when dry; margins recurved; 3.5 to 4 in. long, 1 to 1.25 in. broad; midrib slender, broadened at base; main nerves very inconspicuous even when dry, about 4 pairs, at about 30° with the midrib; reticulations not visible; petiole very thick, rugose, jointed at the junction with the blade. Inflorescence not seen; rachis minutely tuberculate; pedicels slender, 75 to 1 in. long, scurfy. Calyx hyaline, papillose without; tube short; lobes linear-oblong, 05 in. long; scales subulate. Corolla campanulate-rotate, 3 in. broad when open, villous within with cellular hairs, margins fimbriate-crispate; lobes very short, triangular. Corona of 5 processes, attached above the filamenttube, horny and vellow when dry; lower lobe a slightly upcurved linearlanceolate ridged spur; upper similar, erect, dorsally flattened, longer

than the anthers. Staminal-column with filament-tube free from the corona, otherwise short; anthers short, cells parallel; appendages scarious, ovate, curved over the style-apex; pollen-masses flattened, oblong, obliquely truncate with membranous margins, attached by broadly inflated cup-like caudicles to the conical pollen-carriers. Style-apex 5-angled, thick, concave above with a conical apiculus. Fruit not seen.

PERAK: at Gunong Batu Pateh, 4300 ft., Wray 371.

28. DISCHIDIA, Br.

Herbs or undershrubs, usually epiphytic, climbing and rooting on trees or pendulous from them, sometimes almost leafless. usually opposite, fleshy, sometimes converted into pitchers (ascidia), sometimes convex and sessile, rugose or bullate. Flowers very small, often minute, white yellow or red, in axillary racemose or umbellate cymes or fascicles; the rachis short, thick, tuberculate; peduncles stout. Calyx small, 5-partite, membranous, with 5 glandular scales. Corolla campanulate tubular or urceolate; the tube ovoid or globose or cylindric; the mouth usually contracted; lobes 5, thick, valvate. Corona staminal, of 5 membranous processes, adnate to the back of the staminal-column, erect, the tips entire, notched or bifid or with incurved or recurved arms; sometimes none or replaced by a corolline corona (Subg. I. Conchophyllum). Staminal-column very short; filaments connate in a tube; anthers erect, with membranous appendages; pollen-masses 1 in each cell, compressed, waxy, attached by long curved caudicles, usually of cornucopia shape, to the hard oblong pollen-carriers, caudicles in D. coccinea very short. Ovary of 2 carpels; styles short; style-apex flat or with a conical sometimes capitate tip. Fruit of 2 or 1 small slender or thick acuminate follicles; pericarp smooth. Seeds very small, flask-shaped, tipped with a long silky coma. —DISTRIB. About 50 species: in tropical India, the Malay Peninsula and Archipelago, the Philippine Islands, New Guinea and Australia.

Staminal-corona absent (Subgenus I. Conchophyllum):—
Corolla with a corona like a toothed hanging fold; leaves of
two kinds—(1) orbicular, flattened; (2) reniform, markedly
convex and bullate, under '75 in. long and 1 in. broad ..
Corolla with a corona like a thickened undulate fold; leaves
of one kind (so far as known), reniform, slightly convex and
bullate, usually over 1 in. long and 1.5 in. broad ..
Staminal-corona present, membranous, erect, with incurved or
recurved arms (Subgenus II. Eudischidia):—

1. D. astephana.

2. D. depressa.

	Leaves sessile, usually reniform, convex above, closely applied			
	to the tree-trunks or branches (Sect. 1. Collyris):—			
	Leaves not bullate; flowers white, tipped with lilac	3.	D.	Collyris.
	Leaves strongly bullate; flowers scarlet, tipped with lilac	4.	$\mathcal{D}.$	coccinea.
	Leaves partly or wholly converted into pitchers (ascidia)			
	(Sect. 2. Ascidifera):—			
	Ordinary leaves orbiculate, up to 1 in. in diam., pitchers			
	2 to 5 in. long, oblong, curved, more or less smooth	5.	D.	Rafflesiana.
	All leaves (so far as known) converted into subreniform			
	compressed rugose pitchers about 2 in. in diam.	6.	D.	complex.
	Leaves normal, not (so far as known) converted into pitchers			
	or convex and sessile (Sect. 3. NORMALIA):-			
	Corona-processes bifid, emarginate or depressed above;			
	lobes incurved :—			
	Lobes of corona-processes narrow:—			
	Lobes of corona-processes horizontal or upcurved;			
	leaves thick, fleshy, linear-oblong or spathulate	7.	D.	benghalensis.
	Lobes of corona-processes curved downwards, spathu-			
	late; leaves flat, orbicular, papillose beneath	8.	D.	Nummularia.
	Lobes of corona-processes broad:—			
	Leaves ovate, glabrous, not lacunose; corolla-tube			
	merely villous at the throat within	9.	D.	albida.
	Leaves ovate, often hirsute, lacunose; corolla-tube			
	villous at the throat within and with a ring of hairs			
	half-way down also	10.	D.	hirsuta.
	Corona-processes rounded or semilunar above; lobes in-			
	curved, usually somewhat twisted:—			
	Corolla-tube under 1 in. long; lobes short, glabrous or			
	villous within:—			
	Corolla urceolate; tube globose; lobes villous within;			
	leaves lanceolate or ovate-lanceolate, 2.5 to 4 in. long,			
	·75 to 1·25 in. broad; corona-processes extremely thin	11.	\mathcal{D}	acutifolia.
	Corolla campanulate; lobes glabrous within:—			
	Leaves ovate, 1.5 to 2.5 in. long, 1 to 1.75 in. broad;			
	petiole flattened	12.	$\mathcal{D}.$	cordifolia.
	Leaves ovate-lanceolate, 1.5 to 3.5 in. long, .75 to			
	1 in. broad; petiole not flattened	13.	D.	monticola.
	Corolla-tube over ·1 in. long; lobes elongate, villous			
	within:—			
	Corolla urceolate, gradually contracted at the throat;			
	tube 125 in. long; leaves ovate-lanceolate, 2 to 2.5 in.			
	long	14.	D.	Scortechinii.
	Corolla tubular, '3 to '4 in. long, contracted, and again			
	slightly swollen; leaves ovate or ovate-lanceolate, .75			
	to 1.25 in. long	15.	D.	tubuliflora.
	Species of which Leaves only known.			
I	Leaves elliptic or elliptic-ovate, 1.5 to 3 in. long, 75 to 1 in.			
ł	oroad	16.	D.	Deschampsii.

1. DISCHIDIA ASTEPHANA, Scortechini MS. in Herb. Calc. A slender creeping epiphytic herb, closely appressed to and rooting on the trunks and branches of trees; stems minutely scabrous-papillose and hirsute. Leaves fleshy, sessile, appressed to the stem, dark red beneath, of two kinds—(1) orbicular-villous, papillose, 25 to 35 in. in diam.; midrib slender; main nerves about 2 pairs, very obscure; and (2) reniform, very obtuse, upper surface convex, bullate, lower concave with broad pits, papillose with minute annular papillæ, strigosely hirsute: 5 to 75 in. long, 75 to 1 in. broad; nerves visible on the under surface only, irregular, branching, central one (midrib?) thick. few-flowered, on a thick tubercular rachis 25 in. long at the end of a thick peduncle somewhat shorter; pedicels I in. long, angled; buds 5-angled, conical, 15 in. long; flowers white. Calyx membranous; lobes oblong-obtuse, ciliate, hirsute beneath, 05 in. long; scales minute. Corolla urceolate; tube 5-angled, 125 in. long, contracted at the mouth, furnished within with a ring of stiff hairs below the mouth, and about half-way down a corolline corona consisting of a reflexed membranous hanging annular fold with 5 bilobed teeth, otherwise glabrous; lobes ovate, 025 in. long, erect, pubescent within. Staminal-corona none. Staminal-column conical, attached to the base of the corolla-tube; filament-ring short; anther-wings horny, large, 2-folded, spreading outwards; anthers erect, cells parallel; appendages very thin, acuminate, connivent; pollen-masses oblong or clavate, truncate, granular, seated on rather long caudicles with cup-like apex, which connect them with the large oblong shining pollen-carriers. Style-apex long, conical. Follicle 1, lanceolate, 1.25 to 1.75 in. long, acuminate; pericarp very thin, opening out flat and 2-keeled; placenta membranous. Seeds not seen.

PERAK: at Bujong Malacca, Scortechini 1897. Selangor: at Bukit Hitam, Ridley 6570 (in part).

This very interesting species is closely allied to Conchophyllum imbricatum, Bl., the "Pustula arborum" of Rumph. Herb. Amb. V. 473, t. 175, fig. 3. Beccari, in Malesia, II. 258, maintains Blume's genus Conchophyllum, characterized by the absence of a staminal corona. As, however, in all other respects the species seems to us to bear the characters of Dischidia, we have preferred to retain it in that genus, as was done by Scortechini, whose manuscript description in the Calcutta Herbarium has been followed closely.

2. DISCHIDIA DEPRESSA, C. B. Clarke, MS. in Herb. Kew. A slender creeping epiphyte, closely appressed to and rooting on the stems and branches of trees; stems very slender, wiry; rootlets extremely numerous. *Leaves* fleshy, sessile, orbicular-reniform, flattened or somewhat convex and slightly bullate on the upper surface, glabrous or

very slightly papillose on the lower surface, and with small pits; 1 to 1.25 in. long, 1.5 to 1.75 in. broad; midrib stout; main nerves 2 to 3 pairs, the lowest pair from the base spreading horizontally; the others slightly acutely and early branching. Inflorescence not seen. Calyx very thin, hyaline; lobes glabrous, rounded, .03 in. long, obscurely 3-nerved. Corolla urceolate, much depressed; tube when at full length .075 in. long, glabrous within and furnished in the middle with a 5-lobed undulate fold or corolline corona; the throat closed, with stiff inflexed decumbent shining white hairs; lobes triangular, .05 in. long, thickened, villous within. Staminal-corona none. Staminal-column short, pyramidal; anther-wings spreading outwards, horny; appendages very thin, obtuse, connivent; pollen-masses cylindro-clavate, attached by cornucopia-shaped caudicles as long as themselves to the ellipsoid pollen-carriers. Style-apex conical; tip capitate. Fruit not known.

MALACCA: Maingay (K.D.) 1115.

3. DISCHIDIA COLLYRIS, Wall. Cat. 4207 (1829). A creeping epiphyte, trailing over and rooting on the stems and branches of trees; stems slender, terete; rootlets very numerous and spreading. Leaves fleshy, coriaceous when dry, sessile; orbicular, convex above with reflexed margins, mucronate or not at apex, slightly cordate at base in young leaves; wrinkled above, papillose and often farinose beneath; 1 to 1.5 in. in diam.; midrib and nerves distinct on the lower surface; midrib stout; main nerves 2 to 3 pairs, nearly at right angles to the midrib, soon branching and spreading; reticulations very few visible. Umbels on stout tuberculate rachises in pairs at the ends of short stout clavate peduncles; pedicels very short, slender; flowers white, tipped with pale lilac. Calyx membranous, hyaline; lobes ovate, ciliate, 025 in. long. Corolla urceolate; tube globose, about 05 in. long, glabrous on both surfaces, the mouth much contracted, forming a ridge within; lobes triangular, thickened, glabrous, erect. Corona-processes 5, very thinly membranous and hyaline, linear, with a spreading emarginate top with incurved broad flattened lobes. Staminal-column short, conical; appendages erect, acute; pollen-masses oblong, obtuse, seated on cornucopia-shaped flattened caudicles as long as themselves and joined by them to the oblong hard brown pollen-carriers. Style-apex pyramidal; tip somewhat capitate. Follicles (1 or 2?) linear-lanceolate, curved; tip recurved, 2 to 2.5 in. long, .25 in. broad; base slightly gibbous; pericarp thin, pale brown. Seeds cylindrical, 15 in. long by 025 in. broad; base winged and slightly bifid; testa very thin, brown; albumen rather copious; cotyledons ovate, fleshy, 05 in. long; radicle cylindric, thick, ·075 in. long. Hook. f. Fl. Br. Ind. IV. 51. D. albiflora, Griff. Notul. IV. 47, and Ic. Pl. As. t. 410A, fig. 8; Beccari Malesia II. 263. Collyris major, Vahl in Trans. Nat. Hist. Soc. Copenh. VI. 110: Wight Contrib. 66 (in part).

Malacca: Maingay (K.D.) 1114 (perhaps also, but doubtfully, K.D. 1116, with rather large flatter leaves and frequent pustules); Griffith 3779. Singapore: Walker.—Distrib. Burma (Wallich 4207), Java.

We do not feel (any more than, apparently, did the author of the Fl. Br. Ind.) quite sure of the identification of Griffith's specimens with those herein described (Maingay 1114), but believe that they correctly belong to this plant, representing terminal small-leaved sprays. Conchophyllum imbricatum, Bl. Bijdr. 1061, cannot be this species, as it is described as having no staminal corona-processes.

4. DISCHIDIA COCCINEA, Griff. Notul. IV. 45 (1854), and Ic. Pl. Asiat. CCCCIX. A small creeping epiphyte, trailing over and rooting on the stems and branches of trees; stems slender, smooth or papillose or with rounded warts; rootlets very numerous and spreading. Leaves fleshy, coriaceous when dry, sessile; orbicular, convex above, the margins broadly recurved, wrinkled above and with prominent large bullate protuberances, pitted below by the protuberances and minutely papillose, white when young, red when old; 5 to 1 in. in diam.; midrib and 1 to 2 pairs of branching nerves prominent beneath. Umbels about 5- to 6-flowered, on short enlarged rachises at the ends of thick peduncles about 1 in. long; the peduncles in pairs in the axils of the leaf-pairs; pedicels slender, clavate, 15 to 2 in. long; buds broadly conical; flowers scarlet with lilac tips. Calyx membranous, hyaline; lobes very small, obtuse, glabrous. Corolla urceolate; tube gradually attenuate upwards from an inflated base, 1 in. long, slightly puberulous without, glabrous within, with an undulately 5-lobed ridge at a little above half height; lobes triangular-ovate, thickened, 03 in. long, glabrous. Corona-processes 5, membranous, linear, with an emarginate top bearing broad incurved lobes. Staminal-column slender; the antherwings minutely horned; appendages ovate-acute, connivent over the style-apex; pollen-masses oblong, slender, attached by minute cupshaped caudicles to the ovoid dark brown pollen-carriers. Style-apex 5-angled, conical with a subulate capitate tip. Follicles (usually 2) about 1 in. long, curved and much recurved, rather broad; pericarp crustaceous, smooth. Seeds obovoid, .05 in. long, the base minutely winged, the wing dentate; testa thin, pale brown; albumen scanty; cotyledons very small, 3 to 4 times smaller than the ovoid fleshy radicle. Hook. f. Fl. Br. Ind. IV. 51.

Malacca: Maingay (K.D.) 1119; Griffith 3780. Perak: at 4000 to 4500 feet near Larút, King's Collector 3840, 6905; at Gunong Ijuk, Scortechini 1185.

The chief peculiarity of this species is in its pollen-masses being elongate and having very small caudicles, and being therefore quite different from those of any other species we have examined. The Perak specimens have no flowers, and can therefore only be referred here tentatively, but we believe them to be correctly identified.

5. Dischidia Rafflesiana, Wall. Pl. As. Rar. II. 35, t. 142 (1831). and Cat. 4208. A creeping epiphytic undershrub, milky, much branched, rooting on the trunks and branches of trees and often pendent from them; stems glabrous or slightly pubescent, terete, lower ones as thick as a goosequill. Leaves fleshy, coriaceous when dry, changing into pitchers; orbiculate or ovate-orbiculate, obtuse or mucronate sometimes acuminate at apex, rounded at base, slightly peltate; both surfaces glabrous; margins recurved; '75 to 1 in. in diam.; nerves faintly visible beneath; midrib slender; main nerves about 3 to 4 pairs, the lowest pair from the base and making an intramarginal nerve which the others join; petiole stout, flat, 15 to 25 in. long, sometimes longer; pitchers (ascidia) 2 to 5 in. long, fleshy, thick, oblong or ovate-oblong, slightly curved, obtuse, gibbous at base, the cavity filled with rootlets from the adjoining node. Umbels about 6- to 8-flowered, small, rounded, on a thickened tubercular rachis at the end of a long or short (usually 5 in. long) stout peduncle in the axil of the leaves; pedicels slender; buds ovoid; flowers pale yellow. Calyx membranous; lobes lanceolate, acute, ciliate, hirsute without. Corolla fleshy, urceolate; tube ovoid, pubescent without, 15 in. long; lobes short, obtuse, villous with somewhat retrorse stiff white hairs within, erect, 05 in. long. Corona of 5 processes, attached to the base of the staminal-column, each process on a stout base, deeply bilobed; lobes spathulate, incurved. Staminal-column short, conical; anther-cells parallel; appendages acuminate, erect, membranous; pollen-masses rather long, linear-oblongspathulate, seated on cup-shaped clavate brown caudicles, which attach them to the oblong hardened dark pollen-carriers. Follicle 1, 2 to 3 in. long, curved, 3 in. broad below the middle, tapering thence to both ends; pericarp thin, smooth. Seeds 1 in. long, somewhat angled, oblong-obovate, narrowly winged on the margin, broadly winged and often dentate at base, truncate at tip, bearing a silky coma 1 in. or more long; albumen very scanty; cotyledons elliptic, obtuse, 025 in. long; radicle ·5 in. long, cylindric. Griff. Notul. IV. 47, t. 386, fig. 6, and in Trans. Linn. Soc. XX. 387 and 391, tt. 17, 18; Done. in DC. Prodr. VIII. 632; Miq. Fl. Ind. Bat. II. 512; Wight Contrib. 44; Hook. f. Fl. Br. Ind. IV. 50; K. Schum. in Engl. & Prantl Naturl. Pflanzenfam. IV. 2, 228, fig. 87 (from Wallich); Beccari Malesia II. 263. D. viridescens, Griff. l. c. 49. Collyris major, Vahl in Trans. Nat. Hist. Soc. Copenh. VI. 110; Wight Contrib. 66 (in part).

PERAK: at Larút, Kunstler. Malacca: on islands, growing on Anacardium, Maingay (K.D.) 1117. Pahang: near Pekan and Kwala Pahang, Ridley in Trans. Linn. Soc. Ser. 2, III. 320. SINGAPORE: Wallich 4208; Kurz; Deschamps; Kunstler (King's Collector) 1209.—Distrib. India (Cachar, Tenasserim), Borneo, Australia. A coast plant, abundant in dry spots near the sea, disappearing inland (Ridley). The pitchers are usually occupied by ants.

6. DISCHIDIA COMPLEX, Griff. Notul. IV. 50 (1854). A twining epiphyte, growing and rooting on the stems and branches of trees; stems very slender, terete. Leaves replaced by pitchers (ascidia), the pitchers subreniform, compressed, about 2 in. in diam. the orifice small. near the petiole, its margin inflexed, formed into a second pitcher much smaller than the outer one, opening on each side by an oblique opening deeply furrowed on the upper, carinate on the lower, side; the outer cavity filled with rootlets, the inner surfaces lurid purple. subumbellate, white, on thickened rachises at the ends of 1 to 3 in. long stout peduncles. Corolla with sub-globose tube, scarcely narrowed at the mouth; lobes broadly ovate, fleshy, inflexed; the throat of the corolla closed with a ring of hairs. Corona-processes with long narrow arms dilated at the tips. Staminal-column truncate; pollen-masses subobovate, attached by much dilated long keeled caudicles to the pollen-carriers (from Griffith). Hook. f. Fl. Br. Ind. IV. 51; Beccari Malesia II. 265.

MALACCA: Griffith, on trees.

7. DISCHIDIA BENGHALENSIS, Colebr. in Trans. Linn. Soc. XII. 357, t. 15 (1817). A fleshy epiphytic undershrub, rooting on the trunk and branches of trees, often matted and often hanging in flagelliform sprays; stems rather stout, as thick as a goosequill, glabrous, winged when dry. Leaves very fleshy, thick, subsessile; linear-oblong elliptic obovate or spathulate, obtuse and apiculate at apex, attenuate at base; 5 to 2 in. long, 25 to 75 in. broad; midrib and nerves scarcely ever visible, in dried specimens sometimes 3 to 5 pairs of main nerves at an acute angle with the midrib; petiole twisted, 1 to 15 in. long. Umbels axillary, very short-peduncled, about 10-flowered, usually on stout enlarged rachises; pedicels 05 to 1 in. long, slender; buds ovoid; flowers pale yellowish-white. Calyx fleshy; lobes ovate, '03 in. long. Corolla urceolate, glabrous on both sides; tube globose, 05 to 1 in. in diam.; lobes triangular, acute, 03 in. long, thickened within. Corona of 5 slender processes, membranous; stalk linear, branching in 2 falcate recurved subulate laciniæ. Staminal-column short; anther-wings spreading; appendages short, connivent; pollen-masses falcate, truncate above, joined by a curved cup-shaped caudicle half as long as

themselves to the narrow ellipsoid pollen-carriers. Style-apex pyramidal. Follicles usually 1 only, very slender, straight, acuminate, 1.5 to 2.5 in. long, 15 in. broad; pericarp thin, smooth. Seeds almost cylindric, only slightly compressed at the sides, rounded and minutely denticulate below, 1 in. long, truncate at tip and bearing a copious white silky coma; testa thin, pale brown; albumen very scanty; cotyledons fleshy, ovate, 05 in. long from a broad base; radicle stout, nearly as large. Spreng. Syst. Veg. I. 844; Wight Contrib. 43; Dene. in DC. Prodr. VIII. 631; Bot. Mag. t. 2916; Hook. f. Fl. Br. Ind. IV. 50. D. cuneifolia, Wall. Cat. 4206; Dene. l. c. 633. D. spatulata, Blume Bijdr. 1060; Miq. Fl. Ind. Bat. II. 512.

Perak: Scortechini 1188; King's Collector 5751. Singapore: Maingay (K.D.) 1121.—Distrib. India (E. Nepal, Sikkim, Assam and southwards), Java, Borneo.

8. DISCHIDIA NUMMULARIA, Br. Prodr. Fl. Nov. Holl. I. 461 (1810). A very slender epiphytic herb, rooting on the trunks and branches of trees; stems farinose, sometimes papillose or minutely puberulous, grey. Leaves fleshy, coriaceous when dry, farinose; orbicular, acute obtuse or apiculate at apex, rounded at base or sometimes slightly cuneate; under surface more or less papillose; margins often recurved; 25 to ·75 in. in diam.; midrib and 2 to 3 pairs main nerves much branching. reticulating, scarcely visible even when dry; petiole 0 to 05 in. long. Umbels few-flowered, lateral, on short rachises and short thick peduncles or nearly sessile; pedicels 06 in. long; buds ovoid; flowers scarlet. Calyx-lobes minute, acute, membranous. Corolla urceolate; tube .075 in. long, globose; throat villous within, with often retrorse hairs; lobes linear-subulate, 025 in. long, erect, thickened. Corona of 5 processes attached to the base of the staminal-column, each process linear below, bifid above in 2 recurved spathulate lobes. Staminal-column short, conical; anther-wings conspicuous; anther-cells parallel; appendages membranous, acute; pollen-masses oblong-ellipsoid, attached by broad curved caudicles as long as themselves to the small brown horny pollen-carriers. Style-apex 5-lobed; tip conical. Follicles slender, curved, linear-lanceolate, long-acuminate, broad near the base (6 in. when open); pericarp chartaceous, brown, smooth. Seeds flask-shaped, ·05 in. long, truncate at the tip and bearing a 1 in. long white silky coma; testa thin. Wall. Cat. 4204; Wight Contrib. 43; Dene. in Nouv. Ann. Mus. Par. III. 378, and DC. Prodr. VIII. 632; Bl. Bijdr. 1059; Mig. Fl. Ind. Bat. II. 507; Benth. Fl. Austral. IV. 345; Hook. f. Fl. Br. Ind. IV. 49; Beccari Malesia II. 2671, t. lxiii. 7 to 11; Prain Beng. Plants 699. D. orbicularis, Dene. l. c.; Miq. l. c. Collyris minor, Vahl in Act. Soc. Hafn. VI. 111; Wight Contrib. 67. D. Gaudichaudii,

Dene. l.c.; Miq. l.c. 508. "Nummularia lactea minor prima," Rumph. Herb. Amb. V. 472, t. 176, fig. 1.

PENANG: Curtis; Wallich 4204A. PERAK: Scortechini 1109. MALACCA: Griffith 3778; Maingay (K.D.) 1118. PAHANG: in heath country Ridley (see Trans. Linn. Soc., Ser. 2, III. 321). SINGAPORE: Hullett 136, 822; King's Collector 1270.—DISTRIB. India (Cachar, Chittagong, Tenasserim and Andaman Islands), Malay Archipelago, Australia. "A most noxious epiphyte in Singapore, draping and eventually killing trees" (Ridley, l. c.).

Scortechini 1135 is probably this species, but the leaves are slightly ovate. The specimen has no flowers. We cannot separate D. Gaudichaudii even by the retrorse hairs in the throat of the corolla, for the character is most difficult to be sure about in such minute flowers, and otherwise there seems to be no point of difference.

9. Dischidia albida, Griff. Notul. IV. 46 (1854). A slender twining epiphytic herb or undershrub, rooting on the trunks and branches of trees; stems very slender, scabrid-puberulous or glabrous. fleshy, coriaceous when dry; ovate-acute and mucronate at apex, rounded or cordate and slightly peltate at base; glabrous and shining on both surfaces; margins slightly recurved; 5 to 75 in. long, 4 in. broad; nerves very faint when dry; midrib slender; main nerves 3 to 4 pairs, the lowest pair opposite starting from the base and forming an intramarginal looped nerve up to the apex, the remaining 2 to 3 pairs nearly horizontal joining the intramarginal nerve at the sinuses of the loops; reticulations few, netted; petiole stout, 1 to 15 in. long, puberulous. Umbels few-flowered, on minutely tubercular, more or less thick and elongated, rachises at the ends of .5 to .75 in. long rather stout peduncles; pedicels none or very slender, up to 06 in. long; buds ovoid, acute; flowers white tipped with pink. Calyx membranous: lobes ovate-acute, '04 in. long; scales minute. Corolla urceolate; tube ovate-globose, 15 in. long, white-villous at the throat; lobes triangular, erect, very small, with thickened margins. Corona very small, membranous, of 5 processes attached to the base of the staminal-column, linear, bifid; the lobes broad, flat, recurved. Staminal-column rather long, obconic below, conic above; base with a rounded protuberance; anther-wings prominent; anther-cells parallel; appendages acuminate; pollen-masses ellipsoid, granular, seated on cornucopia-like flattened caudicles as long as themselves, which connect them with the ovoidoblong rather large brown pollen-carriers. Style-apex with conical tip. Follicles "very long-beaked, deeply channelled on the inner face" (Griffith). "Seeds with very long slender coma" (Griffith). Fl. Br. Ind. IV. 50.

PERAK: at Bujong Malacea, Curtis; Ulu Batang Padang and Gunong Batu Pateh, 3000 to 5000 ft., Wray 970, 1519; on Maxwell's Hill and at Thaiping, Scortechini 86, 313, 1227. MALACCA: at Toondook, Griffith 3781. Johore: at Gunong Pulai, 1800 ft., G. King.

10. DISCHIDIA HIRSUTA, Done. in DC. Prodr. VIII. 632 (1844). A slender epiphytic trailing herb, rooting on the trunks and branches of trees; stems minutely papillose and slightly hispid-pubescent, nearly white when dry, scarcely ever over 05 in. in diam. Leaves fleshy, coriaceous and very pale when dry; broadly ovate, acute and mucronate at apex, rounded at base and slightly peltate; shining and lacunose above, minutely papillose beneath; margins recurved, often hispid-ciliate; ·5 to 1 in. long, ·5 to ·7 in. broad; midrib and 2 to 3 pairs of main nerves prominent above when dry, the nerves horizontal, meeting a looped intramarginal nerve close to the edge; petiole very short, papillose. Cymes umbellate, 2- to 3-flowered, on very short rachises at the ends of short 15 to 2 in. long papillose axillary peduncles; buds ovoid; flowers dull red, the tube dark blood-red, the lobes rose-coloured. Calyx spreading; lobes membranous, ovate, 05 in. long; scales minute. Corolla urceolate; tube 2 in. long, globose below, contracted at the mouth, furnished within with a row of tufts of hair half-way up and two further rows at the throat, the lower alternate with, the upper opposite to, the short ovate-acute lobes, which are 05 to 1 in long and bear 5 adnate fleshy scales behind the tufts of hair. Corona of 5 rather large very membranous processes from the back of the staminal-column between the wings, slender below, broad and bifid and recurved above; the lobes broadly rounded. Staminal-column conical; the anther-wings prominent, rounded at base; anther-cells parallel; appendages acuminate, membranous, erect; pollen-masses oblong-clavate, obtuse, seated on upcurved brown caudicles with cup-like top, which are half as long as the pollen-masses and connect them to the large conical dark brown pollen-carriers. Style-apex very soft; tip long-conical. Follicles "3 in. long, curved, linear-lanceolate, glabrous" (Scortechini). Miq. Fl. Ind. Bat. II. 599; Hook. f. Fl. Br. Ind. IV. 50; Bot. Mag. t. 7853. D. fasciculata, Done. l. c.; Miq. l. c. D. Brunoniana, Griff. Notul. IV. 44, and Ic. Pl. Asiat. t. 410A, fig. 1 (somewhat incorrect). Leptostemma hirsutum and fasciculatum, Blume Bijdr. 1058.

Penang: at Bato Fereng, Curtis 1897. Perak: at Waterfall Hill, Wray 137; Scortechini 180; at Larút, 200 to 300 ft., King's Collector 6691. Dindings: at Pangkore Island, Scortechini 1077. Malacca: Griffith; Maingay (K.D.) 1120. Singapore: Ridley 2730.—Distrib. Burma (in Tenasserim (Helfer), at Mergui in mangrove forests (Griffith 3782)), Java, Borneo.

11. DISCHIDIA ACUTIFOLIA, Maingay MS.; Hook. f. Fl. Br. Ind. IV. 51 (1883). A slender twining epiphytic undershrub, rather distantly rooting on the stems and branches of trees; stems terete, glabrous, striate when dry. Leaves coriaceous, pergamaceous when dry: lanceolate or ovate-lanceolate; shining and glabrous on both surfaces; margins recurved; 2.5 to 4 in. long, .75 to 1.25 in. broad; midrib slender, impressed above when dry; main nerves 6 to 8 pairs, the lowest pair close to the lower margin, all at from 40° to 60° with the midrib, straight or curving to join an intramarginal looped nerve; reticulations netted; petiole stout, 25 in. long. Umbels few-flowered, in pairs on thickened rachises at the ends of .5 to 1.5 in. long peduncles; pedicels very short; buds conical; flowers pale yellow with pink tips. Calyx very thin, membranous, hyaline; lobes ovate-acute, 025 in. long. Corolla urceolate; tube globose, 05 in. long, throat with a row of usually erect stiff hairs; lobes as long, villous within, triangular, acute, thickened. Corona of 5 exceedingly thin membranous hyaline processes; stem subulate from a broad base, top obtuse, rounded, with 2 rather short spathulate recurved arms. Staminal-column somewhat elongate, filament portion membranous; anther-wings rounded; appendages crenate with erect acuminate tips; pollen-masses oblong, truncate, on cornucopia-shaped curved caudicles as long as themselves, and connected by them to the very slender lanceolate brown pollen-carriers. Styleapex pyramidal. Fruit not known.

PERAK: Scortechini. MALAGGA: Maingay (K.D.) 1122.

We were only able to dissect one flower, and that with some difficulty. In his MS. notes (Vol. IV. pp. 48, 67) Maingay says: "Leaves of staminal-corona minute, so closely adpressed to the anthers that I question if in *dried* specimens of so minute a plant (flower?) they could be discoverable at all; obtuse with short brachia." The corona-processes are, in fact, excessively thin, but they can be separated with care.

12. DISCHIDIA CORDIFOLIA, King & Gamble, n. sp. A creeping epiphytic undershrub, rooting on the trunks and branches of trees; stems about as thick as a crowquill, terete; internodes long. Leaves fleshy, thinly coriaceous when dry; ovate, bluntly acute at apex, rounded or slightly cordate at base; both surfaces glabrous; margins slightly recurved; 1.5 to 2.5 in. long, 1 to 1.75 in. broad; 5- to 7-nerved at the base; midrib slender; marginal pair of nerves very short and faint, second pair curving up to about half the length of the leaf, third pair at an angle of about 30° with the midrib, curving near the margins to form an intramarginal nerve rejoining the midrib a little below the tip; other main nerves none; secondary nerves about 2 pairs; reticulations irregularly netted; petiole 5 in. long, broad, flattened. Umbels few-flowered, in pairs on tubercular rachises about 15 in. long at the ends of stout

peduncles '5 in. long; pedicels very short, slender; buds ovoid. Calyx membranous; lobes ovate-acute, '05 in. long; scales small. Corolla campanulate; tube '1 in. long, glabrous on both sides; lobes '075 in. long, thickened, glabrous. Corona of 5 very thin hyaline processes, about '04 in. long from the back of the anthers between the wings, linear-stalked with orbicular rounded tops and sagittate lobes. Staminal-column attached to the base of the corolla-tube; filament part short; anther-cells parallel; appendages short, acute; pollen-masses ellipsoid, on caudicles nearly as long as themselves, which attach them to the narrowly oblong pollen-carriers; the caudicles curved upwards to a cuplike oblique mouth, and broadly membranously winged on the inside. Style-apex short, blunt. Fruit not known.

PERAK: at Maxwell's Hill, 3000 ft., Scortechini 424, 516.

13. DISCHIDIA MONTICOLA, King & Gamble, n. sp. epiphytic undershrub, rooting at intervals on the trunks and branches of trees; stems slender, terete; internodes long. Leaves fleshy, thinly coriaceous when dry; ovate or ovate-lanceolate, acuminate at apex, rounded or attenuate at base; both surfaces glabrous; margins slightly recurved; 1.5 to 3.5 in. long, 75 to 1 in. broad; 5-nerved; the midrib slender; outer pair of basal nerves short, reaching about the middle of the leaf, second pair at an angle of about 20° with the midrib, forming a looped intramarginal nerve till close to the midrib; main nerves 2 to 3 pairs, short, inconspicuous, joining the midrib to the sinuses of the looped nerve; reticulations netted, irregular; petiole 25 in. long, somewhat twisted. Umbels few-flowered (?), in pairs on tubercular rachises ·2 to ·3 in. long at the end of a ·75 to 1·75 in. long straight lateral peduncle; pedicels very short, slender; buds ovoid; flowers pale green (Wray). Calyx membranous; lobes ovate-acute, puberulous without, ·05 in. long; scales rather large. Corolla campanulate, ·125 in. long; tube glabrous; lobes also glabrous, thickened, scarcely over 025 in. long. Corona of 5 very thin membranous processes, each linear-stalked with a rounded bluntly sagittate head. Staminal-column short; antherwings broad; anther-cells parallel; appendages very long-acuminate; pollen-masses ellipsoid, on cornucopia-shaped caudicles as long as themselves, which connect them to the slender oblong pollen-carriers. Style-apex with a short conical tip. Fruit not known.

Perak: at camp on Ulu Batang Padong, 4900 feet, Wray 1503; on Canfield's Hill, 4000 feet, Scortechini 423, &c.

Scortechini has marked his specimens "D. sagittata, Done.," but they do not agree at all well with the descriptions in DC. Prodr. VIII. 631. There are no specimens of D. sagittata in the Kew Herbarium, but the descriptions give the leaves as obtuse at apex and attenuate into the petiole at base, which hardly suits

 $D.\ monticola$. In the glabrous flowers $D.\ monticola$ and $D.\ cordifolia$ come very near to each other.

14. DISCHIDIA SCORTECHINII, King & Gamble, n. sp. A slender glabrous creeping epiphytic undershrub, sparingly rooting on and often pendulous from the trunks and branches of trees; stems terete; internodes long, 2 to 4 in. or more. Leaves fleshy, pergamaceous when dry; ovate-lanceolate, attenuately acuminate at apex, rounded at base; glabrous on both surfaces; 2 to 2.5 in. long, about 5 in. broad; 3- to 5-nerved; midrib slender, raised beneath, sometimes with a gland at the base: lowest pair of nerves short and faint; next pair prominent forming an intramarginal looped nerve 1 to 15 in, from the midrib nearly or quite to the tip; main nerves about 4 to 5 pairs, leaving the midrib at nearly right angles, and joining the intramarginal nerve at the loop-sinuses; reticulations netted; petiole 15 to 20 in. long, rugose. Umbels few- (5- to 6-) flowered, on short rounded tubercular thick rachises at the ends of stout axillary 3 in. long peduncles; pedicels reddish, slender, 05 in. long; buds lanceolate-ovoid, 15 to 2 in. long; flowers white tipped with scarlet. Calyx membranous; lobes ovateacute, '05 in. long, slightly puberulous without; scales very minute. Corolla urceolate; tube ovoid, glabrous without, pubescent above within, 125 in. long; throat gradually contracted; lobes erect, 1 in. long, thickly villous within, especially in their lower half. Corona of 5 exceedingly thin membranous processes, attached to the backs of the anther part of the column, each process on a narrow base, soon spreading into a rounded obtusely sagittate tip. Staminal-column rather long; filament portion free; anther-wings broad, shining, horny; anther-cells parallel, with acuminate, erect, connivent, membranous appendages; pollen-masses oblong-ellipsoid, attached by slender caudicles as long as themselves to the very narrow slender pollencarriers: the caudicles cornucopia-shaped, with a narrow membranous wing on the inside edge. Style-apex long-conical, membranous. Follicles not known.

PERAK: Scortechini 543.

We at first thought that this was D. lanceolata, Done. (Leptostemma lanceolatum, Bl. Bijdr. 1057), but in that species the bases of the leaves are markedly attenuate into the broad flat petiole, and the venation is more strongly 3- to 5-nerved.

15. DISCHIDIA TUBULIFLORA, King & Gamble, n. sp. A slender creeping epiphytic undershrub, rooting on the trunk and branches of trees; stems wiry, puberulous. *Leaves* fleshy, coriaceous when dry; ovate or ovate-lanceolate, acute or acuminate at apex, rounded at base; glabrous on both surfaces, shining above and wrinkled when dry; margins recurved; '75 to 1.25 in. long, '3 to '6 in. broad; nerves only

clear on under-surface when dry; midrib slender, with usually a gland at the base above; main nerves 3 to 5 pairs, acutely curved to join in a looped intramarginal nerve; petiole 1 to 25 in. long, pubescent. Umbels few-flowered, on a cylindrical tubercular rachis about 25 in. long at the end of a thick 15 in. long peduncle; buds slender, cylindricclavate, reaching 4 to 5 in. long. Calyx membranous; lobes ovateacute, 05 in. long, pubescent without. Corolla tubular, urceolately inflated below, then contracted in a neck having a small swelling in the middle; glabrous without, glabrous within, except a densely villous ring at the swelling; tube 3 to 4 in. long; lobes linear, erect, 1 to ·15 in. long, villous within. Corona of 5 exceedingly thin hyaline processes, which are inserted between the anther-wings, have narrow stalks, and are broadly rounded above and sagittate below. Staminalcolumn elongated; filament part cylindric, 075 in. long; anther-wings horny, tailed at base; anther-cells parallel, with long-acuminate erect connivent appendages; pollen-masses oblong-ellipsoid, on slender caudicles as long as themselves, and connecting them with the ovoidacute pollen-carriers; the caudicles cornucopia-shaped, and having a hyaline inner margin. Style-apex long, subulate-acuminate. Follicle 1, slender, curved, 2 in. long, 1 in. broad, acuminate at tip; pericarp thin, striate, glabrous. Seeds minute, linear, 1 in. long, tipped with a white silky coma; testa thin, pale.

Perak: Scortechini 256, 465; King's Collector 2100.

The description is from Scortechini 465, the only specimen with flowers and fruit, and the only one, consequently, quite certain.

Species of which Leaves only Known.

16. Dischidia Deschampsii, King & Gamble, n. sp. A twining apparently epiphytic undershrub, rooting on the stems and branches of trees; branches slender, terete. Leaves coriaceous; elliptic or elliptic-ovate, bluntly acute at apex, somewhat rounded at base; glabrous on both surfaces and somewhat shining; margins recurved; 1.5 to 3 in. long, .75 to 1 in. broad; midrib slender, raised beneath when dry; main nerves about 5 pairs, the lowest pair from the base forming a looped intramarginal nerve, which is joined at its sinuses by the others, which are at an angle of about 70° with the midrib; reticulations irregular, prominent, all raised on both surfaces when dry; petiole thick, .15 to .25 in. long. Umbels on thickened rachises often .5 to .75 in. long, at the ends of stout peduncles about 1 in. long. Flowers and Fruit unknown.

SINGAPORE: roadsides, Deschamps.

29. Pycnorhachis, Benth.

A hairy twining undershrub. Leaves opposite. Flowers in reflexed pairs, spirally disposed round the long fleshy branches of an axillary racemiform cyme. Calyx 5-partite; scales 5 to 10. Corolla turbinate, with short tube, deeply 5-fid; lobes valvate, slightly twisted to the left. Corona-scales 5, spreading at the base of the staminal-column opposite the anthers. Staminal-column short, adnate to the middle of the corolla-tube; anthers erect, with membranous, hyaline appendages; pollen-masses 1 in each cell, long, slender, cylindric, waxy, erect, attached by short caudicles to the pollen-carriers. Ovary of 2 carpels, sunk in the calyx-tube; style-apex 5-angled, obtusely conical, much shorter than the anthers. Fruit of curved, smooth, cylindric, obtuse follicles. Seeds comose.—Distrib. One species only.

Pycnorhachis Maingayi, Hook. f. in Fl. Br. Ind. IV. 63 (1883). Branches flexuose, hispid with spreading tawny hairs. Leaves oblongobovate, abruptly cuspidate-acuminate at apex, narrowly cordate at base; both surfaces hispidly hairy with bulbous-based hairs, especially on the nerves; 4 to 6 in. long, 1.5 to 2 in. broad; midrib prominent beneath; main nerves 10 to 12 pairs, curving upwards and joined by prominent transverse reticulations; petiole 25 to 5 in. long, villous. Cymes 3 to 6 in. long; peduncle 1 to 2 in. long, thick; branches usually 1 to 3, 3 in. in diam. minutely pubescent flower-pairs on rounded tubercles; pedicels short; buds conical, long-acuminate. Calyx minutely red-hairy without, glabrous within; lobes linear-lanceolate, 1 in. long. Corolla deep purple; tube very short, thickened, with a fringed annulus; lobes about 25 in. long, subulate-lanceolate from a broad base. Corona of 5 thickened fleshy obtuse processes on the backs of the anthers Staminal-column short; appendages long, subulate, hyaline; pollenmasses clavate, slender, attached by minute caudicles to the bases of the linear clavate pollen-carriers. Style-apex deeply 5-lobed; the lobes running up to a rounded apiculus. Follicles 5 in. long, 7 in. broad, cylindric, curved in sickle-shape; pericarp glabrous. Seeds comose.

MALACCA: Maingay (K.D.) 1141.

The description, like that of Fl. Br. Ind., is chiefly taken from the full notes given in Maingay MS. Vol. IV. 64.

Tribe V.—CEROPEGIEÆ.

Stamens with their filaments connate into a tube, and adnate to the style-apex at the top. Anthers erect or incumbent over the style-apex, with or without appendages. Pollen-contents of each anther-cell united in a waxy mass; pollen-masses pellucid on the margin or at

the apex, attached in pairs to the carriers by short caudicles, erect or horizontal in the cells, never pendulous.

30. LEPTADENIA.

Corona double, both staminal: outer cup-shaped, inner usually erect, subulate; flowers rather large; corolla tubular ...

.. 31. CEROPEGIA.

30. LEPTADENIA, R. Br.

Shrubs, twining or erect, and then with stiff much-branched rushlike stems. Leaves opposite, variable, sometimes absent. Flowers small, in umbellate, lateral, sessile or pedunculate, many-flowered cymes. Calyx 5-lobed to the middle or further; scales absent. Corolla deeply 5-lobed, rotate or with a short campanulate tube and spreading lobes: valvate in bud. Corona double; outer corolline, of 5 short transverse or rounded fleshy processes alternating with the lobes of the corolla at the sinuses; inner staminal, of a raised undulate fleshy ring at the base of the staminal-column. Staminal-column arising from the tube of the corolla, to which the filaments are sometimes adnate; anthers incumbent on the style-apex, with minute or no appendages; pollen-masses 1 to each anther-cell, subcrect or erect, ovoid, with a pellucid apex, attached in pairs by fleshy caudicles to the pollen-carriers. Ovary of 2 distinct carpels; style-apex conical, with a 5-angled base; tip often bifid. Fruit of usually 1 thick smooth follicle. Seeds small, ovate-oblong, comose.—DISTRIB. Five or six species, three being twiners and two erect shrubs. Four species are found in Central Africa, one extending through Egypt and Arabia into Western India, one in Madagascar, and one in India and Malaya.

Leptadenia reticulata, W. & A. in Wight Contrib. 47 (1834). A hoary twining shrub; stems with corky deeply cracked bark; branchlets terete, glabrous or hoary-puberulous. Leaves thinly coriaceous; subdeltoid or ovate or ovate-oblong or ovate-lanceolate, acute at apex, rounded or cuneate at base; both surfaces pale, glabrous or more or less finely pubescent; 1.5 to 3 in. long, 75 to 1.75 in. broad; midrib rather broad, without basal glands, but sometimes with a minute tuft of hair at the base; main nerves 5 to 7 pairs, spreading, faint; reticulations netted, obscure; petiole '25 to '75 in. long. Cymes many-flowered, hoary-puberulous, shorter than the leaves, often in pairs on the peduncles; peduncles '25 to '75 in. long; bracts minute, clustered at the thickened bases of the umbels; pedicels slender, up to '5 in. long; buds globose; flowers greenish-yellow. Calyx rotate-campanulate, divided to about the middle, pubescent without; lobes ovate-oblong.

·05 in. long. Corolla rotate, with a short tube; lobes thick, ovatelanceolate, 1 in. long, pubescent, and with a small hairy protuberance on the inner face near the tip. Corona: corolline of 5 fleshy truncate or acute processes at the sinuses, villous on the back and tips; staminal of a sometimes obscure, annular, undulate, ring below the anthers. Staminal-column adherent below to the corolla-tube; filaments united, thin; lower part of anthers thickened, upper part incumbent over the style-apex; appendages minute; pollen-masses ovoid, reticulate, with a pellucid apex, attached by moderately long, often elastic, clavate, pellucid caudicles to the small oblong pollen-carriers. Style-apex 5-rayed, conical, sometimes bifid. Follicles subwoody, 2.5 to 3.5 in. long, .75 in. broad, lanceolate, with a blunt shortly curved beak, keeled on the ventral surface; pericarp smooth, pale grey when dry, thick. Seeds narrowly ovate-oblong, acute, infolded, broadly winged, 25 in. long, ending in a 1 to 1.5 in. long white silky coma; testa thick; cotyledons fleshy; embryo small. Wight Ic. t. 350; Wall. Cat. 8197; Done. in DC. Prodr. VIII. 628; Mig. Fl. Ind. Bat. II. 503; Dalz. & Gibs. Bomb. Fl. 152; Hook, f. Fl. Br. Ind. IV. 63; Trimen Fl. Ceyl. III. 164; Cooke Fl. Bomb. II. 172. L. appendiculata, Done. l.c.; Mig. l.c. L. imberbis, Wight Contrib. 48; Wall. Cat. 8198; Done. l. c. L. brevipes, Wight Cat. 1536. Cynanchum reticulatum, Retz. Obs. II. 15. C. asthmaticum, Herb. Ham. 766. Secamone canescens, Smith in Rees Cycl. Asclepias suberosa, Roxb. Fl. Ind. II. 38. Gymnema aurantiaca, Wall. MSS.

SINGAPORE: Lobb 333.—DISTRIB. Northern Western and Southern India, Burma, Ceylon.

Lobb's specimen has ovate-lanceolate leaves, acute corolline corona-processes, and almost no trace of the ring forming the staminal-corona, but otherwise appears to be the same as the Indian plant.

31. CEROPEGIA, Linn.

Perennial herbs, erect or twining. Rootstock a tuber or a fascicle of thick fleshy roots. Leaves opposite, sometimes minute or 0. Flowers usually moderate-sized or large, of various often singular forms, solitary, in pairs or in umbellate or racemose cymes, lateral, rarely terminal. Calyx 5-partite, with 5 glandular scales within. Corolla tubular, usually more or less inflated at the base, straight or curved, 5-lobed; the lobes free or more or less connate at their tips, valvate in bud. Corona double, arising from the staminal-column; outer cup-shaped, entire or 5- to 10-toothed, or of 5 bifid lobes more or less adnate to the inner corona-lobes and often appearing to form one

series with them, or reduced to minute pouches alternating with the stamens; inner of 5 short or long processes opposite the anthers and incumbent on them or erect, dorsally adnate at their base to the cup of the outer corona or laterally to its lobes, when the corona appears to be formed of 5 lobes with a tooth on each side at their base. Staminal column arising a little above the base of the corolla, short and, with the corona, included in its inflated basal part; anthers erect, ascending or incumbent on the top of the style-apex, without appendages; pollen-masses erect, ascending or subhorizontal, 1 in each anther-cell, subsessile on, or attached in pairs by short caudicles to, the pollen-carriers. Ovary of 2 carpels; style-apex truncate or shortly conical, not exserted. Fruit of 1 or 2 lanceolate or linear-fusiform, acuminate, smooth follicles. Seeds comose.—Distrib. A large genus of 80 or more species, found in Africa, India, Malaya and Tropical Australia.

CEROPEGIA LUCIDA, Wall. Pl. As. Rar. II. 33, t. 139 (1831), and Cat. 8133. A twining shrub, with irregularly fascicled fibrous roots; branchlets glabrous, smooth, more or less angular when dry. Leaves fleshy when green, membranous when dry; ovate- or oblong-lanceolate, acuminate at apex, acute or somewhat obtuse at base; glabrous on both surfaces; 4 to 7 in. long, 1.5 to 3 in. broad; midrib slender; main nerves 6 to 7 pairs, obscure, acutely curving upwards; reticulations irregular, scarcely visible; petiole 5 to 1.5 in. long. Cymes up to 3 in. long, 1 to 3 together at the nodes; peduncles reddish, stout, 1 to 2 in. long, bearing umbellate racemes with a 25 to 5 in. long thickened rachis, and with white rounded glands and linear-subulate bracts; pedicels slender, 5 in. long; flowers green, spotted with purple in the tube and with purple-brown tips to the lobes. Calyx very deeply cleft; lobes linear-subulate, slender, recurved, 4 to 5 in. long; glandular scales rather large, ovate, flat. Corolla 1.5 to 2 in. long, curved, glabrous without, also within, except at the base of the tube, which is sparsely villous; tube scarcely inflated below, broadly funnel-shaped below the lobes; lobes lanceolate, at first spreading, afterwards inflexed and connate at the dilated long-ciliate tips. Corona-processes: outer 10-lobed, lobes short, triangular, long-ciliate; inner linear-spathulate, connivent at the tips. Staminal-column short; pollen-masses nearly globose, subsessile on the clavate pollen-carriers. Style-apex 5-angled; apiculus conical. Fruit not seen. Wight Contrib. 33; Done. in DC. Prodr. VIII. 641; Hook. f. Fl. Br. Ind. IV. 73.

Penang: at Penara Bukit, 1000 ft., Curtis 1007.—DISTRIB. India (Silhet and Cachar), Burma.

Family LXXVII. LOGANIACEÆ.

Trees, shrubs or herbs, sometimes climbers. Leaves opposite, Flowers hermrarely ternate, simple; stipules various or absent. aphrodite or, by abortion, subdiccious, in terminal or axillary, simple or compound, cymes; the cymes sometimes subcapitate or reduced to solitary flowers. Calyx small, inferior, its limb imbricately 4- or 5-toothed or -lobed. Corolla tubular, funnel-shaped or campanulate; limb with 4 or 5 lobes or teeth, imbricate, valvate or contorted. Stamens 4 or 5, inserted on the corolla-tube, alternate with the lobes; anthers 2-celled, their dehiscence introrse, longitudinal, rarely 1-celled, divaricate, with confluent tips. Carpels 2, connate into a free 2-celled ovary; ovules 1 or more in each cell; placentas on the septum or basal at the inner angle; style simple; stigma capitate, 2-fid or 2-partite. Fruit a septicidal capsule or a berry, 1- to many-seeded. Seeds various; albumen fleshy or cartilaginous; embryo straight.—Distrib. About 450 species; tropical and sub-tropical.

Ovary with many ovules in each cell (Tribe I. Euloganieæ):-Herbs; corolla valvate; capsule didymous:-Cymes 2- or 3-chotomous; flowers 5-merous 1. MITREOLA. Flowers solitary or clustered, 4-merous 2. MITRASACME. Shrubs (often scandent) or trees:-Fruit dehiscent, capsular, 2-celled :-Corolla-lobes imbricate .. 3. BUDDLEIA. Corolla-lobes valvate ... 4. Norrisia. Fruit indehiscent :-Corolla-lobes contorted in æstivation .. 5. FAGRÆA. .. 6. Strychnos. Corolla-lobes valvate in æstivation Ovary with a single ovule in each cell (Tribe II. GAERTNERIEÆ) 7. GAERTNERA.

1. MITREOLA, Linn.

Herbs with opposite membranous leaves and small or membranous stipules. Cymes 2- to 3-chotomous, terminal, or peduncled and axillary. Flowers small, white, often secund on the ultimate branches of the cymes. Sepals lanceolate. Corolla urn-shaped, with 5 small valvate lobes. Stamens 5, included. Ovary 2-celled; styles 2, short, at first connate and crowned by the small hairy stigma, ultimately divergent; ovules many in each cell, attached to peltate placentas. Capsule obovoid, laterally compressed, truncate or 2-horned; carpels dehiscing by separating from above downwards from each side of the septum. Seeds numerous, minute, globose or elongate; albumen fleshy; embryo linear.—Distrib. Species 4; 2 of them American, 2 Asiatic.

1. MITREOLA OLDENLANDIOIDES, Wall. Cat. 4350 (1829). Annual,

erect, 6 to 18 in. high. Leaves linear-lanceolate, narrowed at both ends, nearly glabrous, about 2 in. long and .75 in. broad; petiole .25 in. long. Cymes 2 to 6 in. long, often numerous, terminal and axillary, dichotomous; bracts lanceolate, less than .1 in. long. Flowers subsessile, under .1 in. long; capsules 2-horned, secund. Seeds twice as long as broad, trigonous. A. DC. Prodr. IX. 9; Hook. Ic. Plant. 827; Miq. Fl. Ind. Bat. II. 360; Benth. in Journ. Linn. Soc. I. 91; Clarke in Hook. f. Fl. Br. Ind. IV. 79. M. paniculata, Wall. Cat. 4349; Wight Ic. 600 (inaccurate); A. DC. l. c. M. inconspicua, Zoll. et Mor. Vers. (1845 to 1846) 55.

Said to occur in Kedah, but no specimen seen.—DISTRIB. Andaman Islands, Burma, Central Provinces of British India, Malay Archipelago, Australia.

2. MITRASACME, Labill.

Small herbs, with opposite leaves and stipules forming a minute sheath. Flowers small, white, terminal or axillary, solitary, clustered or in irregular umbels. Calyx campanulate, 4-fid. Corolla urceolate, with 4 valvate or reduplicate sometimes spreading lobes. Stamens 4, included; filaments rather short, adnate to the tube; anthers ovate with cordate bases, connective often produced beyond the apex of the parallel cells. Ovary 2-celled; styles 2, connate, separating from the base upwards, finally divergent; stigma capitate or two-lobed; ovules many in each cell, on peltate placentas. Capsule subglobose, laterally subcompressed, truncate, or somewhat 2-horned, dehiscing by the separation from above downwards of the carpels from the septum on each side. Seeds numerous, minute, subglobose; testa smooth, reticulated; albumen fleshy; embryo straight.—Distrib. 28 species, in Eastern Asia, New Zealand, Australia.

MITRASACME POLYMORPHA, R. Br. Prod. Nov. Holl. I. 452 (1810). An erect annual herb, 3 to 9 in. high, often with a long erect branch from the uppermost leaf-axil. Stem slender, glabrous except for a few slender hairs in the leafy part. Leaves sessile, oblong, blunt, confined to the lower inch or two of the stem, glabrous, '2 to '3 in. long, and about '05 in. broad. Umbels terminal, or at the ends of the scanty branches, few-flowered, very lax; pedicels much longer than the flowers, slender, unequal, glabrous. Flowers '15 in. long. Calyx with 4 spreading, triangular, acute lobes. Corolla twice as long as the calyx; throat hairy. Capsule subglobular, glabrous, about '1 in. across. A. DC. Prodr. IX. 10; Benth. Fl. Austral. IV. 353; Solereder in Engl. & Prantl Naturl. Pflanzenfam. IV. 2, 35, Fig. 18A-c. M. capillaris, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. I. 420, and Cat. 4348; Don Prodr.

Fl. Nep. 129; A. DC. l. c. 11; Benth. in Journ. Linn. Soc. I. 92; Miq. Fl. Ind. Bat. II. 362. M. trinervis, Spanoghe in Linnæa XV. 335 (1841); A. DC. l. c. 560. M. malaccensis, Wight. Ic. 1601. Linnophila campanuloides, Benth. in Wall. Cat. 3908.

MALACCA: Goodenough 669. — DISTRIB. Northern and Central India, Burma, Malay Archipelago, China, Australia.

3. BUDDLEIA, Linn.

Trees, shrubs, or herbs. Leaves opposite, entire or crenate, united by a stipular line. Cymes in dense globose or corymbiform cymes, axillary or in a terminal thyrsoid panicle. Calyx campanulate, 4-merous. Corolla urn-shaped; lobes 4, imbricate in bud. Stamens 4, adnate to the corolla-tube; anthers subsessile, ovate or oblong, with cordate or 2-lobed bases; cells parallel. Ovary 2-celled; style linear, clavate; ovules numerous in each cell; stigma terminal or decurrent on two sides. Fruit a septicidally 2-valved capsule; the valves entire or bifid. Seeds many, oblong or fusiform; testa usually lax, or expanded into a wing or tail; albumen fleshy; embryo straight.—Distrib. About 100 species; tropical and subtropical regions of the Old World.

Under surfaces of leaves, young branches, and inflorescence with minute yellowish pubescence 1. B. asiatica.

Under surfaces of leaves, young branches, and inflorescence densely rusty-tomentose 2. B. madagascariensis.

1. BUDDLEIA ASIATICA, Lour. Fl. Cochinch. 72 (1790). A shrub, 3 to 6 ft. high (sometimes as much as 15 ft.); young branches thicker than a crowquill, covered, like the branches of the inflorescence, with a subdeciduous, minute yellowish pubescence. Leaves opposite, membranous; oblong-lanceolate, the apex much acuminate, the base usually much narrowed; edges entire or with minute distant teeth; upper surface dark when dry, glabrous except the puberulous depressed midrib; lower surface pale yellowish-brown, minutely pubescent; main nerves 5 to 7 pairs, curving abruptly upwards and interarching rather far from the edge, thin but prominent like the midrib on the lower surface, obscure on the upper; length 2.5 to 6 in., breadth 6 to 1.5 in.; petiole 1 to 35 in. long. Inflorescence terminal, consisting of numerous 3-flowered sessile cymules, arranged in spikes to form a few-branched lax paniele, 5 to 9 in. long. Flowers :15 in. long, on very short pedicels. Calyx half as long as the corolla, pubescent externally; lobes erect, acuminate. Corolla glaberulous, lobes blunt. Ovary narrowly oblong, tapering to the apex; stigma large, capitate, corrugated. Capsule 2 in. long. Benth. in DC. Prodr. X. 446; Bot. Mag. t. 6323; Brandis For. Fl. 318; Kurz For. Fl. II. 250; Mig. Fl. Ind. Bat.

II. 363; Clarke in Hook. f. Fl. Br. Ind. IV. 82. B. Neemda, Ham. in Wall. Cat. 6401; Roxb. Fl. Ind. ed. Carey and Wall. I. 411; Reichenb. Ic. Bot. Exot. 21. B. discolor, Roth Nov. Spec. 83; Wight Ill. 165B, and Ic. 894. B. salicina, Lamk. Ill. I. 291. B. acuminatissima, Blume Bijdr. 743. B. subserrata, Don Prodr. Fl. Nep. 92. B. virgata, Blanco Fl. Filip. 57. B. serratula, Roth l. c. 82.

In all the Provinces; common.

2. Buddleia madagascariensis, Lamk. Encyc. I. 513 (1783). A slender creeper, 60 to 80 ft. long; young branches half as thick as a crowquill, covered, like the under surfaces of the leaves the inflorescence and the outer surface of the calyx, with dense pale brown tomentum. Leaves coriaceous; elliptic-lanceolate, the apex shortly acuminate, the base cuneate; upper surface very dark when dry, glabrous, reticulate; main nerves about 8 pairs, spreading, slightly prominent on the lower surface and depressed on the upper; length 2 to 3.5 in.; breadth .6 to 1 in.; petiole 3 to 5 in. Inflorescence a terminal, often leafy, thyrsoid panicle, 8 to 12 in. long, with numerous diverging branches from 1 to 2 in. long (shorter near the apex), bearing pedunculate few-flowered umbellate cymules; bracteoles at base of branches linear, about 5 in. long. Flowers orange, 4 in. long, sessile, on very short pedicels. Calyx obovoid-ellipsoid; teeth short, blunt; tube glabrous within. Corolla salver-shaped; lobes of the limb blunt, short, reflexed, glabrescent; tube cylindric, 35 in. long, cottony without, sparsely hairy inside like the narrowly oblong ovary. Anthers sessile near the mouth of the corolla-tube. Capsule globular, 35 in. in diam.; pericarp thick, scaly, dark-coloured. Lamk. Ill I. t. 69, fig. 3; Benth. in DC. Prodr. X. 447; Bot. Mag. 2824.

PENANG: Hullett 121; Murton 4; Ridley 7049; King's Collector 1340. PERAK: King's Collector 5201; Malacca: Maingay (K.D.) 1033/2; Wallich 6402. A native of Madagascar, but in some spots within our area almost naturalised.

4. Norrisia, Gardn.

A shrub; the young parts pubescent. Leaves opposite; petioles dilated at the base and subconnate. Flowers small, yellow. Calyx small, 5-lobed. Corolla with narrow cylindric tube; the limb with 5 small, ovate, valvate lobes. Stamens 5, inserted on the corolla-throat; filaments slender; anthers ovate. Ovary 2-celled; style filiform; stigma capitate; ovules numerous in each cell. Capsule oblong, septicidally 2-valved, carpophore finally free. Seeds numerous; testa lax, 4 to 6 times as long as the linear caudate nucleus; albumen fleshy; embryo straight or curved.—Distrib. Two species; both Malayan.

1. Norrisia malaccensis, Gardn. in Hook. Kew Journ. I. 327 (in part) (1849). A tree; young branches much thinner than a goosequill, terete, deciduously fulvous-puberulous and with many lenticels, dark brown when dry. Leaves thinly coriaceous; ovate or elliptic, acute at each end; upper surface brown, glabrous, shining; the lower rather pale olivaceous, glabrous except the deciduously puberulous midrib and nerves (uniformly puberulous in var.); main nerves 4 to 6 pairs, ascending, curved, prominent like the midrib on the lower surface, indistinct on the upper; length 1.5 to 2.5 in., breadth .85 to 1.25 in.; petiole .25 in. Cymes as in N. major, but smaller, and the flowers only .25 in. long, and the ripe capsules rather less than .15 in. long. Clarke in Hook. f. Fl. Br. Ind. IV. 85 (in part).

Malacca: Griffith (K.D.) 3731 (in part); Maingay (K.D.) 1023; Goodenough 1382; Derry 1035.

VAR. pubescens, King & Gamble. Under surfaces of leaves uniformly pubescent.

Perak: Scortechini 634; King's Collector 10535.

2. Norrisia major, Solereder in Engl. & Prantl. Naturl. Pflanzenfam. IV. 2, 37 (1892). A tree; young branches thinner than a goosequill, terete, deciduously fulvous-puberulous, black when dry. Leaves thinly coriaceous; elliptic or oblong-elliptic, acute, the base cuneate; both surfaces olivaceous-brown when dry, the lower reticulate, both glabrous except the fulvous-puberulous midrib and nerves on the inner surface; main nerves 5 to 7 pairs, stout, oblique, little-curved, deciduously fulvouspuberulous like the midrib on the lower surface; length 2.75 to 3.25 in., breadth 1.5 to .25 in.; petiole .2 to .25 in. long. Cymes in dense, corymbose, terminal, pedunculate panicles, their branches fulvous-tomentose; bracts linear, about 2 in long or less. Flowers sessile or subsessile, minutely bracteolate, 35 in. long. Calyx minute, cupular, 5-toothed. Corolla with a cylindric tube slightly dilated near the base, densely pubescent outside; the mouth with 5 linear-oblong, blunt, much recurved lobes, glabrous inside; filaments much exserted; anthers broadly ovate. Capsule 25 in. long and about 15 in. in diam., ellipsoid, pubescent. Seeds with a much elongate wing at each end. N. malaccensis, Gardn. in Hook. Kew Journ. Bot. I. 327; Clarke in Hook. f. Fl. Br. Ind. IV. 85 (in part). Antonia Griffithii, Wight Ill. II. t. 156B.

PERAK: King's Collector 7845, 10882. MALACCA: Griffith; Maingay (K.D.) 1024; Ridley 1382. SINGAPORE: Ridley 6828.

5. FAGRÆA, Thunb.

Trees or shrubs, often epiphytic, sometimes scandent. Leaves opposite, entire (crenulate in F. crenulata); petioles dilated at the base or united by a stipulary sheath. Cymes terminal or axillary, corymbose racemose or paniculate; bracts small. Flowers large or small, white or yellowish, rarely pink. Calyx deeply 5-fid; its lobes thick, broad, much imbricate. Corolla-tube narrow or funnel-shaped, sometimes much elongate; lobes of its limb broad, twisted to the left in bud. Stamens 5; anthers oblong, on slender filaments. Ovary 2-celled, or 1-celled above; style filiform; stigma capitate; ovules numerous in each cell. Berry 1- to 2-celled. Seeds numerous, immersed in pulp; testa crustaceous; albumen horny; embryo small, straight.—Distrib. About 50 species, in India, China, Japan, Malaya, Australia and the Pacific Islands.

Cymes few-flowered, solitary, sessile or nearly so:—		
Flowers 3 to 6 in. long:—		
Corolla salver-shaped, its tube narrowly cylindric, very		
little dilated at the throat:—		
Tube of corolla nearly 3 in. long and only about 1 in.		
in diam.; limb less than 1 in. across	1.	F. tubulosa.
Tube of corolla 4 in. long and ·35 in. in diam.; limb more		
than 2 in. across	2.	F. carnosa.
Corolla funnel-shaped from near the base :-		
Corolla 5 or 6 in. long	3.	F. auriculata.
Corolla 3.5 in. long	4.	F. Curtisii.
Flowers 1.25 to 2.5 in. long:—		
Limb of corolla 1.5 in. across; stamens only slightly exserted		
Corolla-lobes oblong, blunt; fruit elliptic-ovoid; leaves		
3.5 to 5 in. long and 1.5 to 2.25 in. broad	5.	F. obovata.
Corolla-lobes rotund-oblong; fruit globose, crowned by the		
remains of a stout style; leaves 2.5 to 4.5 in. long and		
1 to 1.75 in. broad	6.	F. lanceolata.
Limb of corolla about '75 in. across; stamens much exserted	7.	F. Wallichiana.
Cymes few-flowered but numerous, arranged in long, usually		
pedunculate, sometimes interrupted, terminal racemes:—		
Flowers 2 in. long; corolla widely funnel-shaped; its limb		
1.5 in. across	8,	F. Maingayi.
Flowers 1 to 1.25 in. long; corolla widely funnel-shaped; the		
limb ·75 to ·9 in. across	9.	F. racemosa.
Cyme solitary, on the apex of a short, slender, terminal or		
axillary peduncle; flowers 1.15 in. long; corolla narrowly funnel-		
	10.	F. ligustrina.
Cymes spreading, corymbose, many-flowered:—		
Flowers 1.5 to 2 in. long; stamens slightly exserted:—		
그들은 그는 집에 없이 들어가는 그는 이번 사람이가 그렇게 살아 있다. 그는 그들은 아이들은 그를 가지 않는 그를 가지 않는 것이다.		F. crenulata.
나는 어린 이렇게 되었다. 그리고 있는 이번, 사이 집에는 경기를 하게 하고 하는데 이루를 하는데, 그는 그들은 그들이 살아가고 가득하고 있는데 하는데 살아 있다.		F. vaginata.
Flowers 5 in. long; stamens much exserted	13.	F. fragrans.

SPECIES IMPERFECTLY KNOWN.

Leaves broadly obovate, very coriaceous; fruit 2 in. or more in length, ovoid, apiculate 14. F. Ridleyi.

Leaves elliptic-oblong, thin when dry; fruit narrowly ovoid, tapered to the base, crowned by the remains of the thick style 15. F. oblonga.

1. FAGRÆA TUBULOSA, Blume Mus. Bot. Lugd.-Bat. I. 167 (1850). A straggling, glabrous, climbing shrub; branches half as thick as a goosequill, terete, pale, sending out rootlets at intervals on the bark of trees. Leaves thinly coriaceous; oblong-elliptic, shortly abruptly acuminate, the base cuneate; both surfaces pale yellowish-green, and dull when dry; main nerves 5 or 6 pairs, inconspicuous on both surfaces; midrib conspicuous; length 4 to 8 in., breadth 1.75 to 2.5 in.; petiole 8 to 1 in. long. Flowers about 3 in. long, sessile, 3 or 4 crowded in a sessile glomerulus at the apex of a branch, with a subcampanulate bract, ·15 in. long, at the base of each. Calyx ·4 in. long, fleshy, tubular; the mouth with 5 short, broad, imbricate teeth. Corolla 3 in. long, salvershaped; the tube slender, cylindric, very slightly wider at the throat, ·1 in. in diam.; limb divided to its base into 5 oblong-oblanceolate lobes 45 in. long. Stamens attached near the mouth of the tube and slightly exserted beyond it. Ovary narrowly ellipsoid, tapering into a glabrous style about as long as the corolla; stigma capitate. Fruit unknown. Miq. Fl. Ind. Bat. II. 373.

Perak: Scortechini 1839; King's Collector 5748; at Bujong Malacca, Ridley 9738.—Distrib. Bangka, Sumatra.

2. FAGRÆA CARNOSA, Jack in Mal. Misc. II. n. 7, 81 (1822). Epiphytal, glabrous; young branches as thick as a swan's quill, smooth, pale brown when dry. Leaves coriaceous; elliptic, sometimes subobovate or subrotund, the apex rounded or subtruncate, mucronate; edges recurved; upper surface when dry somewhat olivaceous, the lower dull brown; main nerves invisible on either surface; midrib prominent on the lower, depressed on the upper surface; length 3 to 4.5 in.; breadth 2 to 2.5 in.; petiole 4 to 5 in. long, swollen at the base. Flowers fleshy, about 6 in. long, solitary or in pairs, terminal, with 2 or more short, woody, pointed bracteoles at their bases, sessile or subsessile. Calyx narrowly campanulate, nearly 1 in. long; its tube very short; the limb with 5 oblong, blunt, suberect lobes. Corolla-tube 4 in. long, cylindric, 35 in. in diam. at the middle, slightly wider towards the mouth; limb campanulate, about 1.25 in. across, with 5 broadly oblong, blunt, spreading lobes. Stamens subsessile near the apex of the tube, included. Style slightly longer than the tube. Fruit the size of a small hen's egg, but narrower and more tapering to the apex. DC. Prodr. IX. 30; Benth. in Journ.

Linn. Soc. IX. 97; Miq. Fl. Ind. Bat. II. 374; Clarke in Hook. f. Fl. Br. Ind. IV. 82.

Perak: Scortechini; Wray 2317; King's Collector 5349, 7296, 8452; Ridley 10297.—Distrib. Burma.

3. FAGRÆA AURICULATA, Jack in Mal. Misc. II. n. 7, 82 (1822). A glabrous shrub; young branches about 5 in. in diam., pale. Leaves thickly coriaceous; oblong-oblanceolate or -obovate; apex subacute or acute, narrowed from about the middle to the stout petiole; both surfaces pale yellowish-brown when dry; main nerves 6 to 8 pairs, spreading, slightly curved, rather conspicuous on the lower surface. invisible on the upper; midrib broad, bold on both surfaces; length 6 to 12 in.; breadth 2.35 to 4 in.; petiole .5 to 1.25 in. long, with 2 rotund, reflexed, stipule-like auricles at the base, 5 to 75 in. across. Flowers thickly coriaceous in all their parts, 5 or 6 in. long, in terminal cymes of about 3; their pedicels about as thick as a goosequill, minutely adpressed, pubescent, 75 to 1.5 in. long, and bearing near the base of the flower one or two pairs of triangular, one-ribbed, appressed, large bracteoles. Calyx ellipsoid, nearly 2 in. long, deeply divided into 5 imbricate elliptic or oblong blunt lobes. Corolla with a cylindric tube about 1 in. long and 5 in. in diam. (when dry); the limb funnel-shaped, 3 to 4 in. long, with 5 deep, oblong, blunt lobes. Stamens 5, included; the filaments attached to the base of the limb by thickened bases; anthers 65 in. long, oblong, deeply bifid at the base the filaments attached by their attenuate apices at the upper end of the notch. Ovary narrowly ellipsoid, glabrous; style stout, 4 in. long; stigma peltate. Fruit narrowly ellipsoid, blunt, glabrous, 2.25 in. or more in length when dry. Wall. Cat. 1596; Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 34 and 573; Pl. As. Rar. III. 15, t. 229; Blume Bijdr. 1020, and Rumph. II. t. 72; DC. Prodr. IX. 29; Miq. Fl. Ind. Bat. II. 371; Clarke in Hook. f. Fl. Br. Ind. IV. 83. F. auricularia, Benth. in Journ. Linn. Soc. I. 98; Kurz For. Fl. II. 204. F. imperialis, Miq. in Ann. Mus. Bot. Lugd.-Bat. II. 226, t. 5. Willughbeia auriculata, Spreng. Syst. curæ post. 71.

Common in all the Provinces.—DISTRIB. Malay Archipelago.

4. Fagræa Curtish, King & Gamble, n. sp. A low spreading tree; young branches as thick as a swan's quill, grey, striate when dry. Leaves very coriaceous; elliptic or slightly obovate, the apex shortly and bluntly acuminate, the base cuneate; both surfaces glabrous, olivaceous when dry; the midrib prominent on the lower surface, faint on the upper, nerves obsolete in both; length 4 to 8.5 in., breadth 2.25 to 3 in.; petiole .5 to .75 in. long, stout, sheathing at the base. Flowers 3.5 in. long, terminal, in pairs; their pedicels stout, compressed, about .5 in. long, bearing

2 pairs of broadly ovate, acute, fleshy bracteoles. $Calyx \cdot 7$ to $\cdot 9$ in. long, very coriaceous, narrowly campanulate, cut one-third of the way down into 5 rounded lobes. Corolla thickly coriaceous, $3\cdot 25$ in. long, funnel-shaped; tube $1\cdot 75$ in. long, much widened towards the mouth; limb spreading, with 5 deep broadly elliptic lobes, with obtusely, minutely, and bluntly apiculate apices. Stamens slightly exserted; anthers oblong, blunt. Fruit unknown.

KEDAH: in Langkawi Island, Curtis 1676.

5. FAGRÆA OBOVATA, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II., 33 (1824). Scandent, glabrous, epiphytic; young branches nearly as thick as a goosequill, brown when dry. Leaves coriaceous; oblong-oblanceolate to elliptic sometimes obovate, the apex abruptly and shortly acuminate or mucronate, the base cuneate; both surfaces brown when dry, the upper tinged olivaceous; main nerves almost invisible; midrib very prominent on the lower surface, less so on the upper; length 3.5 (rarely 2.5 in.) to 5 in., breadth 1.5 to 2.25 in. (rarely only 1 in.); petiole .6 to 1 in. long, swollen at the base. Flowers 2 to 2.25 in. long, sessile or on peduncles 3 in. long, in small terminal sessile cymes of 4 or 5; the cymes with 2 thick oblong bracts at their bases. Calyx 5 to 75 in. long, ·4 in. wide, tubular with 2 thick triangular bracteoles at the base; lobes of limb ovate-elliptic or subrotund, obtuse. Corolla funnel-shaped, 1.8 to 2.15 in. long; the tube .75 in. long, narrowly cylindric below, wider upwards; limb 1.5 in. wide, deeply cut into 5 oblong, blunt, spreading lobes; filaments slender, attached near the apex of the tube, shorter than the corolla-lobes; anthers included, oblong, deeply cleft at the base. Ovary elliptic; style slightly shorter than the anthers; stigma capitate. Fruit elliptic-ovoid, smooth, shining, crowned by the short remains of the style, 1.5 in. long. Wall. Cat. 1595; Blume Bijdr. 1021, and Rumph. II. t. 75; DC. Prodr. IX. 29; Bot. Mag. t. 4205; Griff. Notul. IV. 35, and Ic. Pl. Ind. Or. t. 382; Miq. Fl. Ind. Bat. II. 369; Clarke in Hook, f. Fl. Br. Ind. IV. 83; Kurz For. Fl. II. 205. F. crassifolia, Blume Rumph. II. 78, fig. 1, and Mus. Bot. Lugd.-Bat. I. 166: Thwaites Enum. 200; Mig. l.c. 373; Wall. Cat. 1602. F. malabarica and F. obovato-javana, Blume Rumph. II. 29, t. 75, and Mus. Bot. l. c. 164; Wight Ic. 1317. F. Blumei, Steud.; DC. l.c. 30. F. coromandeliana, Wight Ic. 1316; Bedd. Fl. Sylv. t. 224. F. celebica, Blume Mus. Bot. l. c. 167. F. globosa, Wall. Cat. 1598; DC. l. c. 29. Willinghbeia obovata, Spreng. Syst. curæ post. 71.

Kedah: Curtis. Penang: Curtis 246, 2432, 3013. Perak: Wray 1139, 2115, 2248, 2426, 2714, 3075, 4181, 4269; Scortechini 202, 758; King's Collector 3122, 4024, 4878, 5748, 6214, 6438, 7553, 7578, 8855, 10109, 10634, 10776. Malacca: Griffith (K.D.) 3737; Maingay (K.D.)

1028, 1030, 1031; Derry 1012. Johore: Ridley 6312—Distrib. Malay Archipelago, British India.

Following Mr. Clarke in Hooker's 'Flora of British India,' we have reduced to F. obovata, Wall., not only the forms which have received specific names as above quoted, but also those found in British India, there being no constant characters that we can discover to separate them. Some of the specimens from India have, however, longer flowers, and the main nerves of their leaves are more distinct than in the majority of Malayan specimens.

6. FAGRÆA LANCEOLATA, Blume Bijdr. 1021 (1826). Scandent, 30 to 40 ft. long, glabrous; young branches about as thick as a goosequill, the nodes close together, cinereous when dry. Leaves coriaceous; oblongoblanceolate, subacute, the base much narrowed; both surfaces very dark cinereous when dry; main nerves invisible; midrib bold on the lower surface, faint on the upper; length 2.5 to 4.5 in., breadth 1 to 1.75 in.; petiole .35 to .5 in. long. Flowers terminal, pedunculate, solitary or in pairs or in threes; their peduncles subclavate, about 3 in. long, bibracteolate at the apex, and sometimes with larger bracts at the base. Calyx 5 in. long, obconic, 5-lobed; the lobes coriaceous, fleshy below, rounded, with membranous margins. Corolla 3 in. long, funnel-shaped, the lobes of the limb spreading, oblong-rotund. Stamens 5, exserted. Anthers oblong, obtuse, dorsifixed; filaments slender. Ovary ovoid; style filiform. Fruit obovoid, globose, smooth, shining, nearly 1.5 in. in diam., crowned by a short stout fragment of the style; the calyx at its base with 5 subrotund lobes 45 in. broad and with broad scarious edges. Blume Rumph. II. 31, t. 77, and Mus. Bot. Lugd.-Bat. I. 167; Mig. Fl. Ind. Bat. II. 376.

PERAK: Wray 3202; King's Collector 6848.—DISTRIB. Java.

7. Fagrea Wallichiana, Benth. in Journ. Linn. Soc. I. 98 (1857). A tree?; young branches half as thick as a goosequill, pale brown when dry, glabrous; the leaf-scars close together and prominent. Leaves coriaceous; narrowly elliptic or oblanceolate, apex acute or shortly acuminate, the base much narrowed and forming narrow wings to the petiole; both surfaces glabrous, the upper greenish when dry, the lower brown; main nerves 4 or 5 pairs, curving upwards and forming wide arches 1 to 15 in. from the edge, rather distinct on the lower surface when dry, invisible on the upper; midrib conspicuous on the lower surface; length 2.25 to 3 in., breadth 6 to 1.1 in.; petiole 3 to 5 in. long, winged in its upper part. Flowers (excluding the stamens) 1 to 1.25 in. long, pedicellate, 3 to 5 together in pedunculate lax cymes from the apex and upper leaf-axils; bracteoles few, minute; peduncles about 1 in. long; pedicels about 5 in. Calyx clavate, about 5 in. long; the teeth 5, minute. Corolla salver-shaped, 1 in. long; the tube cylindric, slender, becoming

wider towards the campanulate limb; limb 65 in. in diam., its 5 lobes oblong, obtuse, spreading. Stamens 5, their slender filaments inserted near the apex of the tube and exserted 75 in. beyond its lobes. Anthers (ovate?). Ovary narrowly ellipsoid, tapering to the filiform long-exserted style 2 to 2.5 in. long; stigma narrow. Fruit ellipsoid, slightly tapered each end, shining, 5 in. long. F. lanceolata, Wall. Cat. 1599 (not of Blume); Clarke in Hook. f. Fl. Br. Ind. IV. 85. Cyrtophyllum? lanceolatum, DC. Prodr. IX. 31.

Penang: Curtis 375. Perak: King's Collector 4851. Malacca: Maingay (K.D.) 1029.

8. FAGRÆA MAINGAYI, Clarke in Hook. f. Fl. Br. Ind. IV. 84 (1883). A glabrous tree, 40 to 50 ft. high; young branches as thick as a swan's quill. Leaves large, very coriaceous; oblong to elliptic-oblong, blunt, obtusely apiculate, the base rounded, the edges when dry recurved; upper surface pale or brownish-olivaceous, the lower brown when dry, both dull; main nerves 5 to 8 pairs, stout but faint on both surfaces; midrib stout on the lower surface, faint on the upper; length 7 to 10 in., breadth 2.75 to 4 in.; petiole 5 to 9 in. long, stout, slightly dilated at the base. Cumes few-flowered, subsessile, mixed with some solitary flowers in a terminal, elongate, pedunculate raceme, with a rachis as thick as a goose-quill and 3 to 6 in. long; its peduncle 2 to 3 in. long. Flowers 2 in. long, solitary or in shortly pedunculate cymes of 2 or 3; pedicels 5 in. long, with 2 pairs of broadly ovate-acute bracteoles at their bases. Calyx subglobular or ellipsoid, about 5 in. long, cleft nearly to the base into 5 rotund-ovate lobes with scarious margins. Corolla funnel-shaped, 1.75 in. long; the tube 2 in. in diam. at the base, but gradually expanding upwards; the limb 1.5 in. wide, its lobes 5, broad, blunt. Stamens 5, included. Ovary narrowly ellipsoid, much attenuate upwards; style slender; stigma turbinate, lobed, included. Fruit unknown.

Perak: King's Collector 8671. Malacca: Maingay (K.D.) 1033; Derry 573.

9. Fagrea racemosa, Jack in Roxb. Fl. Ind. ed. Carey & Wall. II. 35 (1824). A glabrous bush or small tree, 12 to 25 ft. high; young branches from half as thick to as thick as a goosequill, pale when dry, and sometimes angled. Leaves large, coriaceous; elliptic or oblong-elliptic to elliptic-rotund, apex blunt but terminated by a short abrupt acute apiculus less than 5 in. long, base cuneate or rounded; both surfaces yellowish-olivaceous when dry, the lower paler; main nerves 5 to 7 pairs, spreading, curving upwards and interarching, 1 to 25 in. from the edge; midrib very prominent on the lower surface, less so on the upper; length 5 to 10 in., breadth 3 to 6 in.; petiole 4 to 8 in. long expanded at

the base. Flowers fleshy, 1 to 1.25 in. long, on thick pedicels arranged in small sessile cymclets crowded in a terminal, pedunculate, sometimes interrupted, raceme, from 1.5 to 6 in. long; peduncle of the raceme 1.5 to 4 in. long; pedicels of the individual flowers 2 to 25 in. long, bearing at their bases several broad, short, bracteoles. Calyx obovoid, 25 to ·35 in. long, cleft half-way into 5 broad subrotund lobes. Corolla ·85 in. to 1 in. long, widely funnel-shaped; the limb .75 to .9 in. across, divided into 5 blunt oblong spreading lobes 25 in. long; tube only ·2 to ·3 in. long, abruptly expanding at the throat. Stamens 5, included; the filaments slender. Anthers broadly elliptic, marginate, deeply cleft Ovary narrowly elliptic; style much thicker than and at the base. about as long as the filaments; stigma capitate. Fruit ellipsoid, smooth, 5 in. long. DC. Prodr. IX. 29; Benth. in Journ. Linn. Soc. I. 99; Kurz For. Fl. II. 205; Benth. Fl. Austral. IV. 367; Clarke in Hook. f. Fl. Br. Ind. IV. 84. F. coarctata, Blume Rumph. II. 33, and Mus. Bot. Lugd.-Bat. I. 170. F. volubilis, Jack in Roxb. l.c. 36; DC. l.c. 30; Mig. Fl. Ind. Bat. II. 367. F. morindæfolia, Blume Rumph. II. 32, t. 73, fig. 2, and t. 79, and Mus. Bot. l. c. 169; DC. l. c. 29; Clarke l. c. F. appendiculata, F. cuspidata, F. robusta, Blume Mus. Bot. l. c. 169, 170. F. Thwaitesii, F. Muell. Fragm. Phyt. Austral. II. 137. Kuhlia morindæfolia, Reinw. in Blume Bijdr. 777. Kentia morindæfolia, Steud-Nomencl. Bot. ed. 2, I. 845. Utania morindæfolia, G. Don Gen. Hist. Dichl. Pl. IV. 663. Willughbeia racemosa, Spreng. Syst. curæ post. 71.

In all the provinces: very common.—DISTRIB. Malayan Archipelago, Burma.

VAR. pauciflora, King & Gamble. Leaves thinly coriaceous; raceme lax, its rachis slender. Flowers solitary or in 2- to 3-flowered cymes, not crowded.

Perak: Wray 1960; King's Collector 707, 1926, 3016, 3242; Scortechini 112. Singapore: Ridley 6315, 8917.—Distrib. Sumatra (Forbes 1927), Java.

10. Fagrea ligustrina, Blume Rumph. II. 33 (1836). A shrub, all parts glabrous; young branches twice as thick as a crowquill, terete, pale yellowish-brown when dry. Leaves coriaceous; elliptic to elliptic-oblong, apex shortly and rather bluntly acuminate, base cuneate; both surfaces pale yellowish-brown when dry; main nerves about 4 pairs, spreading at first, then ascending to form wide arches '15 to '2 in. from the edge, slightly conspicuous on the lower surface, very faint on the upper; midrib stout on the lower surface, slightly channelled on the upper; length 3 to 3.75 in., breadth 1 to 2 in.; petiole '25 to 3 in. long. Flowers 1.15 in. long, on thick pedicels less than '1 in. long, 5 to 10 together in simple or shortly branched terminal or axillary

pedunculate cymes. Calyx fleshy, '15 in. long, pyriform; the mouth with 5 shallow very broad imbricate lobes faintly ciliate at the apex. Corolla slightly exceeding 1 in. in length; the tube narrowly cylindric below, expanding upwards into the narrowly campanulate broadly 5-lobed limb '75 in. wide. Stamens 5, slightly exserted; filaments inserted at the base of the limb, broad, membranous at the edges. Anthers narrowly oblong, blunt, the base deeply auriculate. Ovary narrowly ellipsoid, tapering into a style as long as the stamens; stigma narrow. Fruit clavate, apiculate, smooth, '6 in. long (unripe). Blume Mus. Bot. Lugd.-Bat. I. 171; Benth. in Journ. Linn. Soc. I. 100; Clarke in Hook. f. Fl. Br. Ind. IV. 85.

SINGAPORE: Ridley 1650, 2783, 8453; Lobb.

11. FAGRÆA CRENULATA, Maing. ex Clarke in Hook. f. Fl. Br. Ind. IV. 83 (1883). A tree (or a climber?), all parts glabrous; young branches 75 in. thick, the older with prominent leaf-scars close together, vellowish-brown. Leaves coriaceous; broadly obovate-rotund, with no petiole, but abruptly narrowed above the base and embracing the branch; both surfaces dark brown when dry; the edges minutely crenate; main nerves 4 or 5 pairs, spreading, prominent on the lower surface, slightly depressed on the upper; length 7 to 12 in., breadth 5.5 to 8 in. at the broadest part, but 1 in. or less at the contracted part above the attachment to the branch. Flowers coriaceous, 1.5 in. long, on short thick pedicels or sessile, arranged in terminal pedunculate compound trichotomous cymes with divaricating 4-angled branches; peduncle of cyme compressed, 1 to 3 in. long, with 2 spreading thick concave bracts at its apex. Calyx 35 in. long, campanulate, cut halfway down into 5 unequal broad blunt suberect lobes. Corolla 1.25 in. long, clavate in bud, funnel-shaped; the tube narrowly cylindric, 2 in. long; the limb funnel-shaped, cut a quarter of its length into 5 blunt lobes. Stamens 5, included; filaments attached to the mouth of the tube; anthers oblong, deeply bifid at the base, the cells parallel. Ovary glabrous, ellipsoid-conic, tapering into the thin exserted style; stigma obconic. Fruit ellipsoid (unripe '75 in. long).

KLANG: Ridley 9552. PERAK: Scortechini 1642. MALACCA: Maingay (K.D.) 1032; Ridley 1284. SELANGOR: Ridley 7552.

12. Fagræa vaginata, King & Gamble, n. sp. A large glabrous shrub or small tree, sometimes apparently a climber; young branches from ·25 to ·35 in. in diam., yellowish-cinereous when dry and somewhat 4-angled. Leaves thickly coriaceous; elliptic to obovate-elliptic, blunt or slightly apiculate, much narrowed at the base; upper surface olivaceous, the lower brown when dry; main nerves 5 or 6 pairs, curved, spreading, very prominent on the lower surface, faint on the upper;

midrib very stout on the lower surface, much more slender on the upper; lergth 5 to 9 in., breadth 2.75 to 4 in.; petiole about 1 in. long, expanding into a sheath at the base. Flowers 2 in. long, collected in lax terminal cymose corymbs, 4 in. long, and about as much in breadth; the branches 1.25 to 1.75 in. long, each bearing an umbellate 3-flowered cyme; lower bracts linear-oblong, blunt, 1 in. long, the upper only 15 in. long; pedicels about 5 in. long, bibracteolate at the apex. Calyx 8 or 9 in. long, narrowly tubular in its lower part, the upper much wider; the mouth with 5 broad, blunt, erect lobes, 2 in. long. Corolla 1.5 in. long; its tube 5 in. long; the limb widely funnelshaped, with 5 broad, blunt, spreading lobes. Stamens 5; filaments attached to the mouth of the tube, shorter than the corolla-limb, attached to the oblong anthers at the apex of their deep basal notch; anthers 2 in. long. Ovary ovoid, apiculate; style much shorter than the corolla; stigma conical. Fruit ovoid-conic, crowned by the short style, glabrous, shining, 1.75 in. long.

Perak: Wray 1084, 1992; King's Collector 3868, 4041, 4238, 6605, 10124; Scortechini 817. Selangor: Ridley 7607. — Distrib. Java, Anderson 289: Forbes 827.

Named from its sheathing petioles; allied to F. obovata, Wall.

13. FAGRÆA FRAGRANS, Roxb. Fl. Ind. ed. Carey & Wall. II. 32 (1824). A tree, 100 to 150 ft. high, all parts glabrous; young branches much thinner than a goose-quill, shining, yellowish-brown when dry, the nodes close together. Leaves thinly coriaceous, small; oblanceolate to elliptic, the apex shortly and abruptly acuminate, the base much narrowed; the edges (when dry) slightly waved and recurved; both surfaces olivaceous-brown when dry, the lower the darker, subglandular; main nerves 5 to 8 pairs, subhorizontal, faint on both surfaces; midrib prominent on both, but especially on the lower surface; length 2.25 to 4 in.; petiole 3 to 6 in. long. Cymes axillary or terminal, much branched, pedunculate, corymbose, 20- to 30-flowered. Flowers 5 in. long (excluding the much exserted stamens and style). Calyx under 1 in. length, campanulate, with 5 rounded lobes. Corolla salver-shaped, 5 in. long, its tube narrow; limb with 5 somewhat unequal, oblong, blunt, spreading lobes. Stamens exserted for more than 5 in.; anthers elliptic; filaments slender. Ovary ovoid, glabrous; style longer than the stamens. Fruit subglobose, reddish, 3 in. in diam. Roxb. Fl. Ind. I. 461; Wall. Cat. 1597; Mig. Fl. Ind. Bat. II. 375; Kurz For. Fl. II. 205; Clarke in Hook. f. Fl. Br. Ind. IV. 85. F. peregrina, Blume Rumph. II. t. 80; Field. and Gardn. Sert. t. 6. Cyrtophyllum fragrans, DC. Prodr. IX. 31. C. peregrinum, Reinw.; Blume Bijdr. 1022; DC. l. c.

Penang: Curtis 314. Perak: Low 130; Scortechini 993, 2045; King's Collector 6073, 6175. Malacca: Maingay (K.D.) 1026; Griffith (K.D.) 3735; Derry 53, 272. Singapore: Schomburgk 38; Ridley 8921; G. King.—Distrib. Malay Archipelago.

SPECIES IMPERFECTLY KNOWN.

14. FAGREA RIDLEYI, King & Gamble, n. sp. Epiphytal, quite glabrous; young branches as thick or nearly twice as thick as a swan's quill, brown when dry. Leaves thickly coriaceous; obovate, the apex broad and rounded, much tapered to the base; both surfaces pale yellowish-brown when dry; main nerves 5 pairs, ascending, rather straight, very stout and prominent on the lower surface like the broad midrib; length 5 to 9 in., breadth 3.5 to 6 in.; petiole 1 to 1.5 in. long, very stout, expanded at the base. Flowers unknown. Fruit 2 in. or more in length and 1.25 in. in diam. (when dry), in terminal cymes, ovoid, apiculate, shining; the calyx at its base 1 in. long, campanulate, with 5 broad rotund lobes, coriaceous.

Malacca: on Mount Ophir, Ridley, 3785. SINGAPORE: Ridley 2767, 5845, 11363.

15. Fagræa oblonga, King & Gamble, n. sp. A small tree (or epiphyte?); young branches about as thick as a goose-quill, the internodes short; when dry brownish and shining. Leaves thinly coriaceous; elliptic-oblong, the apex shortly and rather abruptly acuminate, the base cuneate; edge slightly reflexed; both surfaces shining when dry, pale, the upper olivaceous, the lower tinged with yellow; midrib prominent on both, but especially on the lower surface; main nerves invisible; length 5 to 11 in., breadth 1.75 to 2.75 in.; petiole .75 to 1.5 in. long. Flowers unknown. Fruit narrowly ovoid, tapered to the base, shining, crowned by the remains of the thick style, 2 in. long and about 1.25 in. in diam.

Perak: at elevations of about 3500 ft., Scortechini; King's Collector 5430, 8445; Wray 2992; Ridley 5558.

6. STRYCHNOS, Linn.

Trees or scandent shrubs, usually with short, axillary, clavate tendrils. Leaves opposite, with 3 to 5 or more ribs starting at or a little above the base; other nerves less conspicuous. Flowers usually white or yellowish, in terminal or axillary, usually corymbosely paniculate, cymes; bracts and bracteoles small. Calyx small, 5- or 4-partite. Corolla hypocrateriform or campanulate; lobes 5 or 4, valvate. Stamens 5 or 4, inserted at the throat of the corolla-tube or below it; filaments short, filiform; anthers ovate or oblong, with distinct parallel cells.

Ovary 2-celled (or 1-celled in the upper part); ovules many in each cell; style long or short; stigma capitate or obscurely 2-lohed. Fruit a berry, usually globose, indehiscent, with a hardened pericarp. Seeds many, or by abortion 1 to 2 only, immersed in pulp, variously compressed, or if solitary globose; the hilum ventral; albumen usually copious, generally horny; embryo short, with flattened, foliaceous cotyledons and short terete radicle.—Distrib. Tropical and subtropical regions of both hemispheres; species about 100.

In describing the characteristic leaves of this genus, we have distinguished between the prominent "ribs" and the less conspicuous "nerves."

Corolla-tube shorter than the lobes; berry usually small; seeds		
very few:—		
Corolla-tube searcely any, at most 025 in. long, tawny-villous		
within; leaves elliptic	1.	S. Maingayi.
Corolla-tube about ·05 to ·1 in. long:—		
Corolla-lobes about 15 to 2 in.; stamens glabrous, inserted		
at the top of the tube; leaves ovate		S. Curtisii.
Corolla-lobes about 075 in.; stamens villous, inserted at the		
middle of the tube; leaves elliptic-ovate or -oblong	3.	S. laurina.
Corolla-tube equal to or nearly equal to the lobes; berry small;		
seeds few:—		
Corolla-tube and lobes together less than 125 in. long; leaves		
chartaceous; ovary rounded, glabrous:-		
Corolla-tube and lobes glabrous on both sides; stamens in-		
serted a little above the base of the tube; leaves glabrous,		
brown when dry	4.	S. ovalifolia.
Corolla-tube and lobes sparsely villous without, tube		
glabrous and lobes slightly villous within; stamens inserted		
at the throat of the tube; leaves glabrous, yellowish-green		
when dry	5.	S. flavescens.
Corolla-tube and lobes glabrous on both sides, but lobes		
within with a dense tuft of bristles at the base; stamens		
inserted at about two-thirds of tube; leaves softly		
pubescent	6.	S. rufa.
Corolla-tube and lobes 125 to 25 in. long; leaves more or		
less coriaceous: -		
Stamens inserted at the top of the tube:		
Ovary glabrous; corolla-lobes within furnished with a		
dense tuft of bristles at the base; leaves 3- to 5-ribbed	7.	S. malaccensis.
Ovary villous; corolla-lobes within villous-tufted; leaves		
5- to 7-ribbed	8.	S. septemnervis
Stamens inserted at the middle of the tube:—		
Lobes of corolla glabrous within behind a dense tuft of		
bristles; leaves usually 5-ribbed, more or less pubescent	9.	S. pubescens.
Lobes of corolla villous within behind a dense tuft of		
bristles; leaves 3-ribbed, nearly or quite glabrous	10.	S. Ridleyi.

Corolla-tube much longer than the lobes:—

Corolla-tube nearly '25 in. long; lobes '1 in. long; stamens inserted at top of tube; berry large, many-seeded; leaves glabrous, rather small 11. S. Tieuté.

1. STRYCHNOS MAINGAYI, Clarke in Hook. f. Fl. Br. Ind. IV. 88 (1883). A stout climbing shrub; branches rough, brown; branchlets somewhat angular, nearly black, densely studded with white prominent lenticels; nodes swollen and marked by a prominent raised ring; tendrils puberulous, in pairs, about 1 in. long, circinate, thickened upwards, supported by 2 small acute stipules on a .5 to 1 in. long stalk, each pair replacing a leaf near the ends of the branchlets. Leaves coriaceous; elliptic, acuminate atapex, rounded at base; glabrous on both surfaces, olivaceous-brown when dry; 3 to 6 in. long, 1.25 to 3 in. broad; 3- to 5-ribbed; midrib stout, pale beneath and much raised, impressed above; inner pair of side ribs from close above the base, curved upwards, parallel to the margin and looped in the upper half; outside of them and close to the margin a second pair, more or less inconspicuous, also intramarginal and looped; main nerves 6 to 8 pairs, commencing from the midrib about half-way up, very rarely opposite, straight or nearly so to join the principal pair of ribs at the loop sinuses; secondary nerves few, branching; reticulations irregular, prominent; petiole ·15 to ·25 in. long, channelled above. Cymes axillary, sessile, paniculate, reaching 4 in. in length, much branched, the branches short, the rachis angular, pubescent; bracteoles ovate-acute, ciliate, 05 to 1 in. long; flowers extremely numerous, very small; buds obovoid, rounded at tip. Calyx very small; tube short; lobes spreading, ovate-acute, ciliate, 03 in. long. Corolla-tube very short, about 025 in. long, glabrous without, long tawny-villous within; lobes linear-oblong, 1 to ·125 in. long, reflexed in flower. Stamens inserted near top of tube. nearly as long as corolla-lobes; filaments slender, villous; anthers ·04 to ·05 in. long, ovate, densely long-villous-hairy. Ovary rounded. glabrous; style slender; stigma capitate. Berry globose, about 5 to 1 in. in diam.; endocarp smooth, black when dry. Seeds few, flattened. orbicular, 5 in. in diam.; testa coriaceous; cotyledons cordate, 3- to 5nerved; radicle short, stout.

Penang: Curtis 3667. Perak: Scortechini 1026; Wray 2009, 3112, 4279; King's Collector 6291, 8190. Malacca: Maingay (K.D.) 1041, 1042. Singapore: Ridley 5045.

2. STRYCHNOS CURTISH, King & Gamble, n. sp. A large climbing shrub, the stems reaching 6 in. in diam.; branchlets pale brown, dull, somewhat angular, dotted with prominent white lenticels which are often elongate, uppermost pubescent; nodes swollen and with a pale

pubescent ring; tendrils none (or not known!). Leaves coriaceous; ovate or ovate-oblong, rounded or slightly acute or shortly acuminate at apex, rounded or truncate or almost cordate at base; glabrous on both surfaces and olivaceous-brown when dry; 2.5 to 4 in. long, 1.5 to 2 in. broad; 3- to 5-ribbed; midrib stout, faintly impressed above, raised beneath; inner pair of ribs from about 15 in. above the base, conspicuous, gradually curved to the apex, the upper one-half to onethird only looped; outer pair faint, intramarginal, looped and joined to the inner by cross nerves; main nerves about 6 pairs, arched; secondary nerves many, similar to but fainter than main nerves; reticulations irregular; petiole 3 to 5 in. long, black when dry, puberulous. Cymes axillary, sessile, corymbose, many-flowered, 3-chotomous, sparsely pubescent, reaching 2 to 2.5 in. in length and about 1.5 in. in breadth; rachises somewhat angled; primary branches ·5 to ·75 in. long, successive ones shorter; pedicels ·05 in. long; bracts lanceolate-acuminate, tawny-pubescent, 1 to 15 in. long, each pair clasping the rachis; bracteoles minute, pubescent, usually 1 or 2 to each pedicel; buds oblong, 15 in. long, ribbed, puberulous; flowers pale green with a yellowish centre. Calyx small, pubescent; tube short; lobes rounded, ciliate, .05 in. long. Corolla-tube .06 in. long, one-third of the length of the lobes (18 in.), glabrous within; lobes oblong-spathulate, thick, densely tawny-villous inside. Stamens inserted on the top of the tube; filaments slender, glabrous, 1 in. long; anthers oblong, obtuse, not villous. Ovary rounded, pubescent; style slender, pubescent, 1 to ·125 in. long; stigma capitate, often bifid. Berry not known.

Penang: on Government Hill, Curtis 2973. Perak: Gunong Bubu, at 1500 to 2000 ft., King's Collector 7702; Ulu Bubong, King's Collector 10281, 10438.

3. Strychnos laurina, Wall. Cat. 1591 (1828). A stout climbing shrub; branches somewhat angular, with pale yellowish-brown shining bark; lenticels pale, often elongate; nodes swollen; tendrils puberulous at tip only, in pairs, about 1 to 1.5 in. long, circinate, thickened upwards, supported by 2 small acute stipules, on a .75 in. long stalk, each pair replacing a leaf near the ends of the branchlets. Leaves subcoriaceous, elliptic-ovate or -oblong, acuminate at apex, rounded at base; glabrous on both surfaces; 3 to 6 in. long, 1.25 to 2.5 in. broad; 3-ribbed from a little above the base; midrib stout, pale beneath and raised, impressed above, as are the 2 inner ribs, which curve somewhat acutely upwards to the apex, not or only slightly looped above halfway up; outside them and close to the margin another pair more or less inconspicuous, making an intramarginal looped nerve; main nerves faint, 6 to 8 pairs, rarely opposite, straight from the midrib to join the

principal pair of ribs at the loop sinuses; secondary nerves few, branching; reticulations many, in an elegant network, inconspicuous; petiole ·2 to ·3 in. long, channelled above. Cymes pubescent, in rather short axillary sessile corymbs, or in elongate terminal panieles reaching 5 in. in length; rachises angular; bracteoles ovate-acute, ciliate; flowers very numerous, the buds obovoid. Calyx very small; tube short; lobes ovate-obtuse, ciliate, .03 to .05 in. long. Corolla-tube .075 in. long, glabrous without and at the base within, upper part within and lobes densely long tawny-villous; lobes 075 to 1 in. long. Stamens inserted at the middle of the tube; filaments slender, villous, 05 in. long; anthers as long, sparsely retrorse-villous at the base. Ovary rounded, villous, tapering into a conical style; stigma capitate. Berry globose, 5 to 1 in. in diam.; endocarp slightly rough and spotted. Seeds 1 to 2, orbicular, flattened on one surface, convex on the other; testa coriaceous. A. DC. Prodr. IX. 13; Benth. in Journ. Linn. Soc. I. 102; Kurz For. Fl. II. 166; Clarke in Hook. f. Fl. Br. Ind. IV. 88 (excl. var.).

Malacca: Maingay (K.D.) 1035. Pahang: Ridley 2161.—Distrib. India (Cachar, Burma, Griffith 3727, 3729).

Wray 1236 from "lower camp, Gunong Batu Pateh," Perak, is also probably this species, but the leaves are rather thinner and more lanceolate. So, too, probably, are Scortechini 295 and King's Collector 7193, which have very quadrangular branchlets and large leaves; but the specimens are too incomplete for certainty.

4. STRYCHNOS OVALIFOLIA, Wall. Cat. 1592 (1828). A large climbing shrub; branchlets slender, terete, with dark brown shining bark; lenticels few; nodes swollen and with a faint raised line; tendrils none (or not known!). Leaves chartaceous; ovate-lanceolate or -elliptic, acuminate at apex, cuneate at base; glabrous on both surfaces, 3 to 5 in. long, 1.5 to 2.5 in. broad, brown when dry; 3- to 5-ribbed; midrib rather slender, slightly impressed above, raised beneath, as are the 2 inner ribs which start from ·2 to ·4 in. above the base and are curved acutely upwards to the apex, looped only in the upper half; outside them and close to the margin another pair more or less conspicuous, with a marginal looped nerve; main nerves 4 to 5 pairs, faint, straight from the midrib to join the principal pair at the loop sinuses; secondary nerves many; reticulations irregular, fairly prominent; petiole slender, 25 to 5 in. long. Cymes axillary, paniculate, reaching about 2 in. in length, few-flowered; rachis angular, pubescent; bracteoles ovate-acute, ciliate; buds obovoid, short. Calyx very small; lobes ovate-obtuse, pubescent, ciliate, 05 in. long. Corolla-tube '06 in. long, glabrous, as are the lobes on both sides; lobes as long as tube. Stamens inserted a little above the base of the tube; filaments slender; anthers elongate, apiculate. Ovary rounded, glabrous, gradually contracted into the slender style; stigma

capitate. Berry globose, about 75 in. in diam.; endocarp thin, smooth. Seeds 1 to 3, oblong-orbicular, 8 by 5 in., flat, the margin undulate; testa crustaceous; cotyledons cordate. A. DC. Prodr. IX. 13; Benth. in Journ. Linn. Soc. I. 103. S. laurina, Wall., Clarke in Hook. f. Fl. Br. Ind. IV. 88 (partly).

Penang: Wallich 1592; Curtis 3044, 3468. Perak: King's Collector 4865. Malacca: Maingay (K.D.) 1037.

5. STRYCHNOS FLAVESCENS, King & Gamble, n. sp. A large climbing shrub; branchlets slender, stiff, somewhat angular, with pale grey bark; nodes swollen; tendrils none (or not known). Leaves chartaceous; elliptic or elliptic-lanceolate, acute or acuminate at apex, attenuate or occasionally truncate or cordate at base; both surfaces glabrous, light yellowish green; 3 to 5 in. long, 1.5 to 2.75 in. broad; 3- to 5-ribbed from close above the base; midrib strong, somewhat impressed above, as is the inner pair of ribs which start at an angle of about 30° and curve upwards to the apex, faintly looped only near the top; outer pair of ribs quite inconspicuous, close to the margin and regularly looped; main nerves many, irregular, arched, only from 3 to 6 pairs joining the sinuses of the loops of the inner pair of ribs to the midrib; secondary nerves many; reticulations in an elegant network; petiole 3 in. long, channelled above. Cymes terminal, corymbose, minutely yellow-puberulous, reaching 4 in. in length and diam.; peduncle about 1 in. long; rachis angular; bracts linear or lanceolate, often leafy; bracteoles ovate-acute, enclosing the very short pedicels; buds globose; flowers minute, pale green. Calyx campanulate; tube short; lobes rounded, ciliate, .05 in. long, glabrous within. Corolla-tube cylindric, 05 in. long, glabrous within; lobes 4 or 5, as long as tube, sparsely villous without, more thickly so within. Stamens inserted on the throat of the tube; filaments extremely short; anthers ovate-acute, not villous, 025 in. long. Ovary globose, glabrous; style very short; stigma punctate. Berry obovoid, about 1 in. long, 5 in. in diam.; pericarp very thin, greenish, smooth. Seeds 2, inner face flattened, outer convex, ·6 in. long, ·5 in. broad.

Penang: at Waterfall, Curtis 3430, 3667. Perak: at Larút, Scortechini 1498; King's Collector 4998. Malacca: at Ayer Panas, Curtis 3490.

6. STRYCHNOS RUFA, Clarke in Hook. f. Fl. Br. Ind. IV. 89 (1883). A climbing (?) shrub; branches pale brown, smooth, lenticellate; branchlets slender, patently rufous-pubescent, slightly angular; nodes somewhat swollen; tendrils none (so far as known). Leaves chartaceous; elliptic or elliptic-ovate, acute at apex, cuneate or rounded or subcordate at base; upper surface sparsely pubescent or glabrate, lower surface softly rufous-pubescent; 2.5 to 4.5 in. long, 1.5 to 2 in. broad; 3- to 5-ribbed; midrib rather

stout; inner pair of ribs more slender from a short distance only above the base, at about 40° with the midrib, slightly looped above; outer pair inconspicuous, much looped; main nerves 3 to 4 pairs, joining the midrib and side nerves and nearly straight; secondary nerves many, arched; reticulations fairly conspicuous; petiole ·15 in. long. Cymes small, axillary, scarcely reaching 5 in. long, 75 in. broad; sessile, rufous-pubescent; branches trichotomous; pedicels slender, 1 in. long; bracteoles linear, small; buds small, oblong. Calyx very small; lobes ovate, acute, ·05 in. long. Corolla-tube campanulate, ·06 in. long, glabrous within, puberulous without; lobes a little shorter than tube, also glabrous within, but with a thick white tuft of bristly hairs at the base of each. Stamens inserted at about two-thirds of the height of the tube; filaments very short; anthers ovate, apiculate, retrorsely villous-hairy below. Ovary globose, glabrous; style very short; stigma capitate. Berry globose or oblong, 5 to 1.25 in. in diam., few-seeded; pericarp thick. Seeds ovate-oblong, compressed, '75 in. long by '5 in. broad; albumen thin.

PERAK: at Tapa and Relan Tujor, Wray 1334, 4033; at Campar, Ridley 9698; King's Collector 3973, 6199, 10187. MALACCA: Maingay (K.D.) 1034. SELANGOR: at Kwala Lumpor, Curtis 2398.

We have felt a little doubt about this species, which is merely represented by one fruiting specimen in the Kew Herbarium; but believe the identifications to be correct. The flowers are described from Curtis's specimen, the fruits from Maingay's and Wray's 1334.

7. STRYCHNOS MALACCENSIS, Benth. in Journ. Linn. Soc. I. 101 (1857). A climbing shrub; branchlets dark brown, terete, puberulous; nodes slightly swollen; tendrils pubescent, single or in pairs, reaching 1 to 2 in. in length, circinate, thickened upwards but again reduced at the tip, each replacing a leaf at the ends of the branchlets. Leaves subcoriaceous; ovate or elliptic-ovate, acute at apex, cuneate to rounded at base; glabrous on both surfaces, except in young leaves and on the midrib beneath; 2 to 4 in. long, 1.5 to 2 in. broad; 3- to 5-ribbed; midrib slender, impressed above; inner pair of ribs from about 5 in. above the base, starting at an angle of about 30° with the midrib, curving upwards to the apex, looped in the upper third; outer pair intramarginal, slender, looped; main nerves about 5 pairs, straight from the midrib to the inner ribs; reticulations many, in an elegant network; petiole 2 to 3 in. long, slender. Cymes axillary, corymbose, reaching 1 in. long and broad, fulvous-pubescent; peduncles 3 in. long; bracteoles very small; pedicels slender; flowers small, greyish-white; buds obovoid. Calyx very small; tube short; lobes ovate, acute, ciliate, puberulous, ·05 in. long. Corolla-tube campanulate, ·06 to ·07 in. long, minutely

pubescent in the upper part within or nearly glabrous, puberulous without; lobes as long as or a little shorter than tube, with a dense tuft of pale bristles at the base within, otherwise glabrous. Stamens inserted at the top of the tube; filaments very short; anthers ovoid, ·03 in. long, densely hairy, especially with retrorse hairs at the base. Ovary conoidal, glabrous, gradually attenuated into a rather thick style ·05 in. long; stigma capitate. Berry ovoid, 1 in. long by ·75 in. in diam.; pericarp of two layers, outer pergamaceous, shining, thin, inner hard, woody. Seed 1, oblong; albumen horny, copious; cotyledons ovate-acute, strongly nerved, ·1 in. long; radicle thick. Miq. Fl. Ind. Bat. II. 379, 1080; Clarke in Hook. f. Fl. Br. Ind. IV. 89. S. Gauthierana, Pierre MS. in Herb. Kew.

Penang: Curtis 1515; King's Collector 1539. Malacca: Griffith (K.D.) 3724.—Distrib. Burma (Tenasserim or Andamans, Helfer 3724; Tavoy, Shaikh Mokim 336), Cambodia.

8. Strychnos septemnervis, Clarke in Hook. f. Fl. Br. Ind. IV. 88 A climbing shrub; branches stout, obscurely angled, pale brown, sparsely lenticellate, swollen at the nodes and prominently ringed; tendrils none (or not known!). Leaves coriaceous; elliptic, shortly acuminate at apex, attenuate at base, glabrous on both surfaces; 2.5 to 4.5 in. long, 1.5 to 2.5 in. broad; 5- to 7-ribbed; midrib stout, more or less raised on both surfaces; inner pair of ribs from about 25 in. above the base, strong, acutely angled (about 10° at first) with the midrib and curving upwards to the apex, looped in the upper half, next pair much less conspicuous; outer pair faint or absent; main nerves many pairs, arched between the midrib and first side ribs; reticulations strong, prominent on both surfaces; petiole 3 to 4 in. long. Cymes axillary, sessile, many-flowered, reaching 5 in. in length but usually shorter, rusty-pubescent; rachis somewhat angled; bracts small, ovate, acute, ciliate; flowers rather large; buds oblong-obovoid. Calyx very small; lobes ovate, acute or obtuse, ciliate, 05 in. long. Corolla-tube campanulate, 15 in. long, glabrous without, pubescent within in upper part and with villous tufts at the throat; lobes 1 in. long, recurved, pubescent within. Stamens inserted at the top of the tube; filaments short, villous, 025 in. long; anthers oblong, apiculate, 05 in. long, exsert, villous. Ovary conical, villous, gradually narrowed into a 15 in. long exsert style, villous below; stigma capitate or obsoletely lobed. Berry rather small, reaching 5 in. in length, ovoid; pericarp smooth, crustaceous, thin. Seed 1, flat, round.

Penang: at Penara Bukit, Curtis 1021. Malacca: Maingay (K.D.) 1036.

9. STRYCHNOS PUBESCENS, Clarke in Hook. f. Fl. Br. Ind. IV. 89 (1883). A large climbing shrub; branchlets rather slender, tawny-pubescent, brown, somewhat striate; nodes swollen, with a ring; tendrils single, circinate, tawny-pubescent, enlarged upwards, 1 to 1.5 in. long, each replacing a leaf in end branchlets or occasionally axillary. Leaves yellow when dry, subcoriaceous; ovate, acute at apex, rounded or sometimes attenuate at base, sometimes cordate on ultimate branchlets; upper surface glabrous or puberulous, lower glabrescent when old, pubescent when young; 1 to 3.5 in. long, .75 to 2.25 in. broad; 3- to 5-ribbed, midrib and ribs conspicuous, strongly impressed above; inner pair of ribs from about ·3 to ·6 in. above the base, starting at about 30°, outer pair at about 45° with the midrib starting from close to the base; main nerves joining them to the midrib arched, about 6 pairs; reticulations obscure; petiole ·1 to ·2 in. long. Cymes small, axillary and subterminal, dense, up to ·75 in. in diam., tawny-puberulous to pubescent; bracts lanceolate, small; pedicels short, with 2 bracteoles; buds oblong; flowers white. Calyx very small; lobes rounded, ciliate, 04 in. long. Corolla-tube a little longer than the lobes, cylindric, minutely puberulous without, glabrous within; lobes glabrous within, but each with a dense tuft of white bristles at its base; tube and lobes together 125 in. long. Stamens inserted on the middle of the tube, sessile or with minute filaments; anthers ovate, 025 in. long, apiculate, retrorsely sparsely hairy at base only. Ovary glabrous; style very short; stigma capitate. Berry globose, 3 to 6 in. in diam.; pericarp thin, crustaceous. Seeds 1 to 2, flat or concave on one surface, convex on the other, 5 in. long by 4 in. broad.

Penang: Curtis 970, 3649. Perak: at Larút, Scortechini 1485; at Relan Tujor, Wray 1916; at Thaipeng, Wray 3048; at Selama, Wray 4278; at Larút, King's Collector 2441, 3623, 6276, 6477. Malacca: Maingay (K.D.) 1040; Curtis 3494. Negri Sembilan: at Perhentian Tinggi, Ridley 10089. Singapore: at Bukit Timah, Ridley 6317.

Scortechini, in his notes on his No. 1858, says he thinks that that specimen "shows some differences from S. pubescens which may amount to specific distinction; the flowers being pedicellate, the apex of the anthers obtuse, and the style long." No. 1858 is clearly the very last part of a long climbing branch, and such parts often differ a good deal from the more typical parts, so that we are doubtful of its being capable of separation, and prefer to call it:—

Var. Scortechinii, King & Gamble. Leaves ovate, acute at apex, rounded at base or almost cordate, densely, softly rusty-tomentose on the lower surface; ribs 3 to 5, starting close to the base. Cymes small, axillary. Stamens inserted above the middle of the tube of the corolla, not apiculate. Style longer than in type. Berry oblong.

Perak: at Dambung Batak, Scortechini 1858.

10. STRYCHNOS RIDLEYI, King & Gamble, n. sp. A climbing shrub: branchlets slender, terete, nearly black when dry, uppermost only sparsely pubescent; nodes slightly swollen, with a pale line; tendrils single, much circinate, much enlarged upwards, nearly 2 in. long. Leaves subcoriaceous, nearly black when dry; ovate or ovate-lanceolate, acute at apex, attenuate or rounded at base; glabrous on both surfaces except for faint tufts in the rib-axils beneath; 1.5 to 3.25 in. long, 1 to 1.75 in. broad; 3- to 5-ribbed, midrib strong, impressed above; inner pair of ribs more slender, from 1 to 2 in. above the base, starting at an angle of about 30° with the midrib, curving upwards to the apex and distantly looped above; near the margin a very faint pair looped and intramarginal; main nerves few, 2 to 3 pairs, straight to the sinuses of the loops of the side ribs; secondary nerves many; reticulations slender, inconspicuous; petiole · 3 to · 4 in. long, rather stout. Cymes axillary, few-flowered, puberulous, reaching '75 in. in length and diameter; peduncles 25 in. long; bracts lanceolate, sheathing, ciliate; bracteoles minute, rounded or acute; pedicels about 05 in. long; buds oblong, black when dry. Calyx very small; lobes broad, obtuse, '04 in. long, ciliate. Corolla-tube campanulate, 075 in. long, glabrous on both surfaces; lobes as long as tube, glabrous without, densely villous within, and furnished at the base with tufts of pale bristles. Stamens inserted at the middle of the corolla-tube; filaments very short; anthers ovate, rounded, 035 in. long, sparsely villous at the base. Ovary globose, glabrous, with a short style and capitate stigma. Fruit unknown.

SINGAPORE: at Toas, Ridley 6313.

This species resembles S. pubescens in having the stamens inserted at the middle of the corolla-tube, and in the globose ovary and short style, but the lobes of the corolla are villous within, and the leaves are quite different.

11. Strychnos Tieuté, Lesch. in Ann. Mus. Hist. Nat. XVI. 479, t. 23 (1810). A large climbing shrub; branches grey, lenticellate, stiff; branchlets dark brown, slender; nodes somewhat swollen; tendrils single, circinate, much enlarged upwards and at length woody, 1 to 2 in. long, glabrous, replacing an occasional leaf of a pair on ultimate branchlets. Leaves chartaceous or subcoriaceous; elliptic or elliptic-lanceolate, bluntly caudate-acuminate at apex, acute or rounded at base; both surfaces glabrous, olive-brown, upper shining; 2.5 to 3.5 in. long, 1 to 1.5 in. broad; 3- to 5-ribbed, midrib slender, impressed above; inner pair of ribs from about 15 in. above the base, prominent, starting at an angle of 40° or less with the midrib and curving upwards to the apex, looped above the middle; outer pair obscure, forming a faint intramarginal looped rib more or less to the apex; main nerves 3 to 6 pairs,

reaching the sinuses of the loops of the inner basal ribs; secondary nerves very many, similar to main nerves; reticulations prominent, irregular; petiole 2 to 3 in. long, curved. Cymes axillary, corymbose, usually sessile, reaching 1 in. in length and 1.25 in. in breadth, few-(12- to 18-) flowered; peduncles short; branches of rachis very slender, 3-chotomous; bracts linear, short; bracteoles minute, rounded, 2 to each pedicel below the calyx; pedicels puberulous, 1 to 25 in. long; flower-buds clavate, top rounded; flowers white, sweet-scented. Calyx very small; lobes ovate-lanceolate, acute, 05 in. long. Corolla infundibuliform; tube slender, 2 to 25 in. long, minutely puberulous without, glabrous within; lobes oblong, 1 in. long, glabrous. Stamens inserted at the top of the tube; filaments very short, but decurrent in lines down the interior of the tube; anthers oblong, 05 in. long, apiculate, glabrous. Ovary ovoid, glabrous, alternated into a 25 in. long style; stigma capitate, obtuse. Berry globose, many-seeded, 1.5 to 2.5 in. in diameter; pericarp thick, woody, shining, smooth, yellowish at first, afterwards red. Seeds immersed in pulp, rounded, ovoid or oblong, more or less flattened, usually 75 in. long, and about 25 in. broad; testa thin, silvery; albumen horny; cotyledons cordate, acute, 3- to 5nerved, 15 in. long; radicle stout, cylindric, as long as cotyledons. Bl. Rumph. I. 67, t. 24; A. DC. Prodr. IX. 13; Mig. Fl. Ind. Bat. II. 380. S. Maingayi var. ? fructuosa, Clarke in Hook. f. Fl. Br. Ind. IV. 88.

Penang: Curtis 709, 1490; Ridley 9358. Perak: King's Collector 5348, 10595. Malacca: Maingay (K.D.) 1038; Corporal Ali and Corporal Hasan. Singapore: Ridley.—Distrib. Java (Horsfield, Zollinger), Borneo (Beccari 1580).

King's Collector, No. 10311, from Perak, agrees fairly well with S. Horsfieldiana, Miq., but the specimens are too incomplete to warrant description.

7. GAERTNERA, Lamk.

Trees or shrubs. Leaves opposite, rarely ternate, entire, coriaceous, penninerved; stipules connate into a cylindrical sheath. Cymes axillary or terminal, many- or 3- to 1-flowered. Calyx small, funnel-shaped or campanulate. Corolla-tube longer than the calyx; its limb with 4 or 5 lobes; valvate in bud. Stamens adnate to the corolla-tube by short filaments. Ovary 2-celled; style short or long; stigmas 2, linear or clavate; ovule solitary in each cell, erect. Berry didymous, subglobose, crustaceous. Seeds often compressed; albumen horny or fleshy; embryo small.—Distrib. About 40 species, in the tropics of Asia and Africa.

Leaves glabrous :—		
Leaves narrowly elliptic-oblong, usually under 4 in. in		
length:—		
Flowers 4-merous	1.	G. viminea.
Flowers 5-merous	2.	G. Koenigii var.
Leaves oblong-oblanceolate, much tapered to the long petiole,		[oxyphylla]
7 to 12 in. in length:—		
Cymes densely umbellate, crowded	3.	G. obesa.
Cymes laxly paniculate	4.	G. oblanceolata.
Leaves hairy beneath, elliptic-oblong, slightly narrowed at the		
base; petiole not very long	5.	G. grisea.

1. Gaertnera viminea, Hook. f. ex Clarke in Fl. Br. Ind. IV. 91 (1883). A shrub; young shoots as thick as a crow-quill, glabrous. Leaves membranous; narrowly lanceolate, apex caudate-acuminate, the base much narrowed; both surfaces brown when dry, the upper glabrous, the lower minutely scaly; length 2·5 to 3·5 in., breadth ·6 to ·8 in.; petiole about ·1 in. long. Flowers only about ·25 in. long, in small terminal trichotomous nearly glabrous cymes; lowest bracts linear, sometimes ·4 in. long; pedicels very short. Calyx cupular, with 4 spreading teeth. Corolla villous at the throat, 4-lobed. Fruit obovoid-globose, ·2 in. long. Psychotria viminea, Wall. Cat. 8354.

SINGAPORE: Wallich 8354; Ridley 4828, 9500.

2. Gaertnera Koenigii, Wight Ic. 1318 (1850); var. oxyphylla, Clarke in Hook. f. Fl. Br. Ind. IV. 91 (1883). A small tree; all parts except the inflorescence glabrous; young branches thicker than a crow-quill, pale brown, terete. Leaves thinly coriaceous; narrowly elliptic-oblong, sometimes somewhat oblanceolate, apex shortly caudate-acuminate, base much narrowed; both surfaces pale olivaceous-brown when dry, the lower minutely scaly; midrib distinct; main nerves 6 to 8 pairs, curving upwards, thin but distinct on the lower surface; length 2.5 to 4 in., breadth ·8 to 1·35 in.; petiole ·2 to ·4 in. long. Stipules forming an oblong sheath, 5-toothed or bifid, 25 in. long; the apex and ultimately the whole deciduous. Panicles terminal, cymose, lax, less than half as long as the leaves when in flower, elongating in fruit; branches divaricate, opposite, the ultimate branches 3-flowered. Flowers 25 in. long, on puberulous pedicels longer or shorter than themselves, bracteolate near the apex. Calyx short, tubular, irregularly 5-toothed. Corolla tubular, glabrous outside, slightly curved; the mouth with 5 (sometimes 4) thick spreading subacute lobes. Stamens included; anthers linear, slightly bifid at the base, on short filaments. Ovary 2-celled, each cell 1-oyuled. Fruit globular, 3 in. in diam., slightly compressed, with a deep vertical groove on each side (subdidymous), glabrous, smooth; the apex areolate, but without remains of the calyx. G. thyrsiflora, Blume

Mus. Bot. Lugd.-Bat. 174; Benth. in Journ. Linn. Soc. I. 112. Gacuminata, Benth. l.c. G. Junghuhnii, Miq. Fl. Ind. Bat. II. 383. Sykesia Koenigii and S. thyrsiflora, Arn. Pug. Pl. Ind. Or. 35; DC. Prodr. IX. 35. Psychotria vaginans, DC. Prodr. IV. 520; W. & A. Prodr. 434. Psychotria sp., Wall. Cat. 8342, 8388. P. oxyphylla Wall. Cat. 8374; Benth. l.c.

PERAK: at elevations over 3000 ft., Scortechini 305; King's Collector 8063; Wray 214, 279, 4113, 4122.

3. Gaertnera obesa, Hook. f. Fl. Br. Ind. IV. 92 (1883). A small shrub: young branches compressed, as thick as a swan's guill or thicker, almost glabrous, pale brown, their apices often quite enveloped in the large stipules. Leaves subcoriaceous, large; oblong-lanceolate or oblongelliptic, shortly acuminate at apex, narrowed at the base into the stout winged petiole; both surfaces drying brown, glabrous, the lower minutely lepidote when young; midrib broad; main nerves 9 to 12 pairs, slightly curved, ascending, conspicuous on the lower surface, the intermediate nerves also distinct although thin; length 9 to 12 in., breadth 3 to 3.5 in.; petiole 1 to 1.5 in. long, broadly channelled; its upper part winged. Stipules 1.25 to 1.5 in. long, coriaceous, broadly oblong, acuminate when young, but afterwards, from the breaking off of the upper part, blunt or obscurely bifid; the base auricled. Cymes (including their peduncles) not much exceeding the leaf-petioles in length, usually terminal, densely umbellate, about 1.25 in. across, bearing about 3 umbellate main branches compressed and puberulous like the peduncle but much shorter, and at the base several linear bracts about .5 in. long. Flowers · 3 in. long, sessile or shortly pedicelled in short, few-flowered, broadly bracteolate cymelets on the ultimate branchlets. Calyx campanulate, puberulous outside; the limb obscurely toothed, entire and truncate, enlarging with age. Corolla twice as long as the calyx, fleshy, tubular; the limb with 5 short acute inflexed lobes, glabrous outside, densely hairy in the upper half inside. Anthers 5, oblong, blunt, cordate at the base, inserted by short filaments near the base of the tube. Fruit unknown. Psychotria obesa, Wall. Cat. 8328.

PERAK: Scortechini. Malacca: Maingay (K.D.) 925. SINGAPORE: on Bukit Timah, Ridley 2680; Hullett 118, 137; Walker 212.

Var. angustifolia, King & Gamble. Leaves not exceeding 2.75 in. in breadth. Cymes axillary, 1.5 in. long.

PERAK: Scortechini. Only a single specimen collected.

4. GAERTNERA OBLANCEOLATA, King & Gamble, n. sp. A glabrous shrub, 4 to 8 ft. high; branches about as thick as a goose-quill, subquadrangular, dark-coloured. *Leaves* subcoriaceous; oblong-oblanceolate, shortly and somewhat abruptly acuminate, gradually narrowed

from above the middle to the short petiole; both surfaces when dry brown, tinged (especially on the paler lower surface) with olivaceous, the midrib prominent on both; the 10 to 12 pairs of curved ascending main nerves prominent on the lower but indistinct on the upper surface; length 7 to 9 in., breadth 1.75 to 3.5 in.; petiole .6 to 1 in long. Stipules spathaceous, 1.25 in. long, opening on one side, embracing the petiole by a rounded basal wing; the upper part caducous and leaving the irregularly quadrate, persistent, coriaceous, pale, margined base. Cymes paniculate, lax, with a few linear deflexed bracteoles, supra-axillary, about 3 in. long (longer in fruit), one-third being peduncle; the branches few, lax, the lower deflexed. Flowers in threes, rather crowded towards the apices of the branches, on thick pedicels shorter than themselves, before expansion only about 1 in. long. Calyx cylindric; the mouth under ·1 in. in diam., very shortly 5-toothed, glabrous outside like the corolla. Corolla-tube twice as long as the calyx, constricted above the middle; the lobes triangular, thick; the throat very hairy inside. Anthers hidden amongst hairs: their filaments short. Ovary 2-celled, the cells 1-ovuled. Fruit glabrous, obliquely obovoid or globular, but somewhat contracted at the base, crowned by the minute remains of the calyx, about ·3 in. in length. Seed (by abortion) solitary, with much horny albumen.

Perak: Scortechini 203; Wray 1948, 2283; King's Collector 8449.

5. GAERTNERA GRISEA, Hook. f. Fl. Br. Ind. IV. 92 (1883). A small bush; young branches as thick as a swan- or goose-quill, compressed, pale, minutely pubescent. Leaves coriaceous, large; oblong or ellipticoblong, apex shortly acuminate, base rounded or cuneate; edges slightly recurved; upper surface glabrous, lower softly pale-cinereous-pubescent; main nerves 8 or 9 pairs, oblique, slightly curved, bold on the lower surface, faint on the upper; midrib broad, prominent on the lower surface (when dry), flat on the upper; length 8 to 11 in., breadth 2 to 4.5 in.; petiole ·35 to ·75 in.; intra-petiolar stipules united to form an adpressed cinereous-pubescent sheath, .75 in. long, with 1 or 2 apical points. Cymes terminal or axillary, solitary, 2.5 to 5 in. long and 2 to 3 in. across, cinereous-pubescent everywhere, on peduncles 1 to 4 in. long, trichotomous and with small triangular bracts at the divisions. Flowers ·25 to ·3 in. long. Calyx under ·1 in. long, campanulate, with 5 broad, triangular, spreading teeth. Corolla 2 to 25 in. long, thick, cylindric; limb short, with 5 deep, oblong-lanceolate, valvate lobes with inflexed tips. Anthers 5, linear, inserted by short filaments below the glabrous throat. Style thick; stigma with 2 broad lobes. Ovary 2-celled; ovules numerous. Fruit unkown. Psychotria?, Wall. Cat. 8389.

Johore: Ridley 11123; Murton 159. Singapore: Wallich; Ridley 2697.

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JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

Vol. LXXIV., Part II.—Extra Number, 1907.

Materials for a Flora of the Malayan Peninsula.—By Sir George King, K.C.I.E., LL.D., F.R.S., late Superintendent of the Royal Botanic Garden, Calcutta, and J. Sykes Gamble, C.I.E., F.R.S., late of the Indian Forest Department.

No. 20.

The present Part contains the descriptions of three Families, No. 89 Acanthaceæ, which was only finished by the late Mr. C. B. Clarke, F.R.S., just before his lamented death in August, 1906, and Nos. 91 Labiatæ and 92 Plantaginaceæ, which have been done by Lt.-Col. Prain, C.I.E., F.R.S., Director of the Royal Gardens, Kew.

The 3 Families comprise 54 genera and 166 species. In the Acanthaceæ there are 35 genera and 134 species, of which 5 genera and 68 species are new. In the Labiatæ the genera are 18 and the species 31, one genus being newly described. But it is worthy of note that of the 31 species only 16 are really native in the Malay Peninsula, the rest being introduced plants. One species only is endemic, Plectranthus Kunstleri, Prain. In Plantaginaceæ there is merely one genus containing one species, an introduced weed.

It may here be usefully recorded that, in addition to his work on the Malay Peninsula Acanthaceæ herein given, the late Mr. Clarke also prepared an account of the species of the Malay Archipelago, which will shortly be published in the 'Journal of the Linnean Society.'

Part No. 21, which will contain two Families, No. 86 Gesneraceæ and No. 90 Verbenaceæ, and thus complete the Gamopetalæ, may be expected to issue about the New Year.

Family LXXXIX.—ACANTHACEÆ.

[By C. B. CLARKE.]

Herbs or shrubs, or twining plants (Thunbergia). Leaves opposite, often unequal, in Polytrema sometimes pseudalternate; stipules 0. Inflorescence various; spikes strobilate or heads or cymose or flowers solitary: bracts and prophylla large, small or 0. Flowers 2-sexual, Calyx inferior; segments 5 or 4, nearly free or more or less Corolla gamopetalous; tube campanulate or linear; limb united. 2-lipped or 5-lobed, more or less 1-sided. Stamens on the corolla 4 didynamous, or 2 (with or without rudiments); anther-cells 2 or 1; pollen ellipsoid (then usually ribbed or banded longitudinally) or globose (then often honeycombed or echinulate). Ovary superior, 2-celled; ovules 2 to 1, or several, superimposed in vertical rows (or 2 collateral in Thunbergia); style long, simple, minutely 2-fid. Capsule loculicidal, often elastically dehiscent; seeds usually nearly as many as the ovules, held up on rigid curved retinacula (outgrowths of the funicle); albumen 0.—Distrib. Species 2000, throughout the warmer parts of the world.

This Family is specially characterized by the retinacula and the seeds placed in a vertical line; this character fails in the first two Subfamilies. The plants of Subfamily II. Nelsonfoider are frequently mistaken for those of Scrophulariacer, from which they differ by the seeds being superimposed vertically.

Conspectus of the Subfamilies, Tribes, and Genera.

Subfamily I. Thunbergioidem. Seeds 4 to 2 in the capsule without retinacula. Twiners	1. THUNBERGIA.
size:—	
Stamens 2	2. Nelsonia.
Stamens 4:—	
Flowers in spikes, racemes, or panicles	3. STAUROGYNE.
Flowers axillary	4. CARDANTHERA.
Subfamily III. Ruellioidem. Retinacula present. Corolla-lobes contorted in the bud:—	
Tribe 1. RUELLINE. Capsule with more than 4 seeds, which are hygroscopically shaggy on the margin :—	
Pollen honeycombed. Flowers axillary. Capsule clavate	7. RUELLIA.
Pollen echinate. Capsule seed-bearing from the base	8. Aporuellia.
Pollen ellipsoid, with many longitudinal ribs. Capsule	
hardly stalked :—	
마시트 그 그 그 그 그 그 그 나가 그 살아 가는 아들이 하는 아니라 하는 것 같아. 그는 그 이 그래요요요 하다고 하셨다.	

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Corolla distinctly 2-lipped:—	. 1	
Spikes continuous or axillary clusters		HYGROPHILA.
Flowers in 1-sided axillary open racemes	6.	NOMAPHILA.
Corolla obscurely or scarcely 2-lipped:—	1	
Thyrsus terminal, 8 to 12 by 75 in.		STENOTHYRSUS.
Spikes terminal or short-peduncled heads	10.	HEMIGRAPHIS.
Tribe 2. Strobilanthinæ. Capsule with 4 (or 2) seeds:—		
Pollen ellipsoid, longitudinally ribbed:—		
Stamens 4	12.	STROBILANTHES.
Stamens 2		Endopogon.
Pollen globose, echinate. Stamens 4	13.	ACANTHOPALE.
Subfamily IV. ACANTHOIDEE. Retinacula present. Corolla with		
the posticous lip cut away; anticous lip 3-lobed, the middle		
lobe bifid	14.	ACANTHUS.
Subfamily V. Justiciondez. Retinacula present. Corolla-lobes		
imbricated in the bud, i.e. one lobe wholly within, one wholly		
without, the others:—		
Tribe 1. GYMNOSTACHYINÆ. Capsule with more than 4 seeds.		
Bracts inconspicuous, hardly as long as the small sepals,		
which rarely attain one-fifth inch in length. Stamens 2:-		
Capsule cylindric at base; seeds in the clavate top	16.	PHLOGACANTHUS.
Capsule with parallel sides; seed-bearing from the base:—		
Corolla-tube cylindric, scarcely inflated:—		
Seeds hygroscopically hairy on the margin	15.	Gymnostachyum.
Seeds glabrous, stony	17.	Andrographis.
Corolla-tube much inflated upwards	18.	CYSTACANTHUS.
Tribe 2. Asystasinæ. Capsule with 4 seeds. Stamens 4:—		
Sepals united at base for at least one-third of their length	20.	PHIALACANTHUS.
Sepals nearly free at base:—		
Capsule at base cylindric; seeds in the upper wider part:-		
Anther-cells at equal height		Asystasia.
One anther-cell below the other		FILETIA.
Capsule conic; the 4 seeds near the base	22.	LEPIDAGATHIS.
Tribe 3. BARLERIINÆ. Capsule 2- to 4-seeded. Stamens 2,		
fertile. Calyx large, 4-partite to the base. Anther-cells 2,		
rounded at base. Pollen globose, reticulated. Corolla yellow,		
1·25 in. long	23.	BARLERIA.
Tribe 4. Erantheminæ. Capsule 4- to 2-seeded. Stamens 2.		
Anther-cells 2, rounded at base. Corolla-tube linear; limb		
subequally 5-fid, spreading	24.	ERANTHEMUM.
Tribe 5. Justiciinæ. Capsule 4- to 2-seeded. Corolla dis-		
tinctly 2-lipped. Stamens 2. Calyx small, subequally deeply		
lobed. Seeds smooth or tuberculate, but without needle-like		
hygroscopic hairs:—		
Sect. 1. Monothecieæ. Anthers 1-celled:—		
Corolla 1.25 in. long, orange-red	25.	CLINACANTHUS.
Sect. 2. Typicæ. Anthers 2-celled. The flower not ap-		
pearing as though enclosed between two opposite bracts.		
Placentæ in fruit not rising elastically from the base of the		
capsule:—		

One anther-cell below the other, tailed	26. JUSTICIA.
One anther-cell somewhat below the other, its base	
rounded or acute, scarcely tailed:—	
Corolla-tube broad. Shrub	27. ADHATODA.
Corolla-tube linear; posticous lip small, twisted	28. RHINACANTHUS.
Anther-cells at equal or nearly equal height, not tailed :-	
Corolla ·3 to ·7 in. long:—	
Spikes, racemes, or panicles terminal	29. LEDA.
Cymes small, axillary	30. POLYTREMA.
Corolla 1·25 in. long:—	
Corolla green-blue	31. Ecbolium.
Corolla red	32. Graptophyllum.
Sect. 3. Hypoestex. Flower appearing as though en-	
closed between two bracts. Placentæ in fruit not rising	
elastically:-	
Anther-cells 2, one placed higher	33. Peristrophe.
Anthers 1-celled	34. Hypoestes.
Sect. 4. Solutæ. Placentæ rising in fruit elastically from	
the base of the capsule, and throwing out the seeds:—	
Flowers in spikes, with prominent bracts	35. Rungia.

1. THUNBERGIA, Linn. f.

[Character narrowed, as throughout Acanthaceæ, to the Malay Peninsula species.]

Leaves petioled, opposite, subequal, undivided, often toothed or lobed. Peduncles solitary, axillary, running into terminal racemes, i.e. the upper floral leaves (or bracts) greatly reduced, inconspicuous or obsolete. Bracteoles (prophylla) large, often 5 in. long, broad-oblong from a truncate base. Calyx of 8 to 14 small lanceolate teeth, or obsolete (appears a mere rim). Corolla large; tube cylindric or campanulate; limb of 5 subequal lobes, contorted in the bud. Stamens 4, subsimilar; anther-cells 2, parallel, sometimes strongly spurred at the base; pollen large (50 to 60 μ in diam.), globose, smooth, with faint spiral bands or strongly spinous. Ovary 2-celled, with 2 ovules in each cell; stigma of 2 equal, opposite, triangular lobes. Capsule globose, with a long oblong-linear beak; seeds 4, or by suppression 3 to 2, hemispheric, excavate on the plane face, wrinkled on the spheric face; sessile, not held aloft on retinacula.—DISTRIB. Species 100, in the warm parts of the Old World; most numerous in Africa, extending to Australia.

Sect. 1. Calyx a mere rim. Anther-cells spurred. Pollen smooth:—

Leaves broad-oblong,	entire or slightl	y toothed .	1. T.	laurifolia.
Leaves round-ovate, to	oothed or often l	obed .	2. T.	grandiflora.

Sect. 2. Calyx of 8 to 12 teeth. Anther-cells not spurred. Pollen spinous:—

Petioles not winged. Corolla pure white .. 3. T. fragrans.
Petioles often winged. Corolla yellow, with claret eye .. 4. T. alata.

1. THUNBERGIA LAURIFOLIA, Lindl. in Gard. Chron. p. 260 (1856). Scandent, up to 150 ft. long (Kurz). Leaves 3.5 by 1.5 in., broadoblong, wide at base, truncate or ovate, glabrous, sub-3-nerved, entire or slightly toothed; petioles 5 to 1 in. long. Peduncles axillary, solitary, distant or more often running into terminal close racemes 2 to 5 in. long; bracteoles (prophylla) 1 in. long, oblong, usually slightly pubescent. Calyx a mere rim. Corolla 2 in. long, blue or blue and white; tube campanulate, only contracted for a very short space at the base. Stamens 4, subsimilar; filaments glabrous; anthercells with a rigid long spur at the base, fringed with many long pilose hairs; pollen globose, large (50 μ in diam.), smooth, with obscure broad spiral bands. Pistil glabrous; the two stigmatic lobes subopposite. Capsule globose, smooth, brown, 25 in. in diam., with 4 to 2 seeds; beak 1 to 1.25 in. long, oblong-linear. Seeds hemispheric, cerebro-granular, excavated on the plane face. Hook. Bot. Mag. t. 4985; Kurz For. Fl. II. 240; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 392; Lindau in Engl. Jahrb. XVII. (1893) Beibl. 41, pp. 41, 42, and in Engl. & Prantl Pflanzenfam. IV. 3B, 292; Ridley in Trans. Linn. Soc. ser. 2, III. (1893) 332. T. Harrisii, Hook. Bot. Mag. t. 4998.

Malacca: Maingay (K.D.) 1170; Thoban Isle, Helfer; Goping, King's Collector 1064. Perak: Wray 3145; Scortechini 2197; King's Collector 3030, 8418. Pulau Manis: fide Ridley. Penang and Kedah: Curtis.—Distrib. Northwards to Arracan.

2. Thunbergia grandiflora, Roxb. Hort. Beng. 45 (1813 to 1814). Leaves ovate or rounded, 3 to 6 in. in diam., pubescent beneath, palmately 5- to 7-nerved from the base, usually angular or lobed, rarely nearly entire; otherwise as T. laurifolia. Roxb. Fl. Ind. III. 34; Hook. Bot. Mag. t. 2366; Nees in DC. Prodr. XI. 54 (with all syn. except Roxb. Cor. Pl. t. 67); Kurz For. Fl. II. 240; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 392; Lindau in Engl. Jahrb. XVII. (1893) Beibl. 41, pp. 37, 39, and in Engl. & Prantl Pflanzenfam. IV. 3B, 292; Hemsl. in Journ. Linn. Soc. XXVI. (1890) 237; Prain Beng. Plants 796. Flemingia grandiflora, Rottler in Neue Schr. Gesell. Nat. Freunde IV. (1803) 202.

SINGAPORE: Schomburgk 84.—DISTRIB. Bengal to South China. Perhaps Schomburgk's specimen was from a cultivated plant.

This species runs excessively close to T. laurifolia, but Lindau has put T. grandiflora in a different Section because it has "flowers solitary, axillary." The inflorescence is exactly the same in both species; in *T. grandiflora* the flowers are very generally in terminal racemes, the upper bracts (floral leaves) being often only 25 to 5 in. long.

3. Thunbergia fragrans, Roxb. Cor. Pl. I. 47 t. 67 (1795). Twining, often 4 to 8 ft. long. Leaves 3 by 1 to 1.5 in., oblong or elliptic, obtuse, rounded or hastate at base, nearly entire, nearly glabrous or (in form javanica) pubescent, sub-3-nerved; petiole .25 to .5 in. long. Peduncles 1 to 3 in. long, axillary, solitary, rarely two together; bracteoles (prophylla) 5 to 7 in. long, oblong-lanceolate. about 12 narrow-oblong teeth 15 in. long. Corolla white; tube 5 to ·75 in. long, narrow-oblong, contracted at top and bottom; limb of 5 obovate, emarginate, spreading lobes. Stamens 4, in the corolla-tube, glabrous; anthers not spurred; pollen globose (50 μ in diam.), the borders of the spiral bands carrying spines so long that the bands are obscured. Pistil glabrous; the 2 stigmatic lobes opposite. Capsule cuboid-globose, '4 in. in diam.; beak '8 in. long, oblong-linear. Seeds 4 (or by suppression fewer), hemispheric, cerebroid, granular, with a hole in the plane face. Nees in DC. Prodr. XI. 56; Kurz For. Fl. II. 240; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 390 (with all syn.); Lindau in Engl. Jahrb. XVII. (1893) Beibl. 41, pp. 36, 38, and in Engl. & Prantl Pflanzenfam. IV. 3B, 292; Ridley in Trans. Linn. Soc. ser. 2, III. (1893) 332, and in Journ. As. Soc. Straits 121 (Singapore 1900); Hemsl. in Journ. Linn. Soc. XXVI. (1890) 237; Prain Beng. Plants 795.

PEKAN: fide Ridley. — DISTRIB. Throughout India, extending to Timor; Philippine Islands (Palawan, Bermejos 193).

FORMA β javanica (sp.), Gaertn. f. Fruct. III. (1805) 22 t. 183, fig. 4; leaves beneath, petioles, and peduncles pubescent (in Wray 52, rufous shaggy). Blume Bijdr. 806; Moritzi! Verz. Zollinger Pfl. 46; Hassk. Cat. Hort. Bogor. 147.

SINGAPORE: Kunstler 25; Ulu Kenring, Wray 52. KEDAH: Curtis.
—Distrib. Throughout Malaya to North Australia.

4. Thunbergia alata, Sims Bot. Mag. t. 2591 (1825). Villous. Leaves cordate-ovate, subentire; petioles 1 to 2 in. long, often winged. Corolla yellow or nearly white; tube with a dark claret mouth, exactly cylindric, twice as thick as that of T. fragrams, otherwise resembling T. fragrams. Bojer Hort. Maurit. 259 (1837); Hook. Exot. Fl. III. t. 177, Bot. Mag. t. 3512; Kurz For. Fl. II. 240; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 491; Lindau in Engl. Jahrb. XVII. (1893) Beibl. 41, 37, 40, and in Engl. & Prantl Pflanzenfam. IV. 3 B, 292; Burkill in Dyer Fl. Trop. Afr. V. 9, 16; Prain Beng. Plants 795; Ridley in Journ. As. Soc. Straits 121 (Singapore 1900).

SINGAPORE: Kunstler 151; Deschamps.—DISTRIB. Native in warm Africa and Mascarenia, a common plant; runs wild as a weed in India and South-East Asia.

2. Nelsonia, R. Br.

A diffuse herb. Leaves opposite, subequal. Flowers small, in dense small spikes; bracts spiral or alternate (not opposite). Calyx small, sub-4-lobed. Corolla-tube slender; limb 2-lipped. Stamens 2; anthers 2-celled, subincluded in the corolla-tube. Ovary 2-celled; ovules about 8 in each, arranged vertically in two rows on the double placental line in each cell. Capsule ovoid-conic, with 8 to 16 seeds in the basal half; retinacula 0.—Distrib. Species 1, in warm parts of Africa, India, Australia, America.

N.B.—This plant is often sorted amongst Scrophulariaceæ; nor does it differ except by the arrangement of the ovules and seeds in one vertical line on the margin of the carpellary leaf.

1. Nelsonia campestris, R. Br. Prodr. 481 (1810). Prostrate, hairy; branches often 12 to 18 in. long. Leaves of stem 2 to 3 in. long, oblong or obovate, nearly entire, long-petioled or nearly sessile; basal leaves often 6 in. long. Flowers in small heads, 5 in. in diam.; terminal or on axillary peduncles which lengthen out in fruit to 2 to 3 in.; bracts oyate, 15 in. long; bracteoles very small. Calyx 125 in. long, 2-lipped; one lip deeply 3-fid, the other shortly 2-fid. Corolla 15 in. long, rose or white. Pistil glabrous; style shortly 2-fid. Stamens 2; anther of 2 ellipsoid cells half-divergent; pollen globose, 25 μ in diam., subtetrahedral (almost as in Scrophulariaceæ). Capsule ·15 in. long; seeds ellipsoid, brown, granular. Endl. Iconogr. t. 79; Benth. Fl. Austral. IV. 543; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 394 (with all syn.); Burkill in Dyer Fl. Trop. Afr. V. 28; Prain Beng. Plants 797. N. tomentosa, Nees in Wall. Pl. As. Rar. III. (1832) 79; Nees in DC. Prodr. XI. 65; Mig. Fl. Ind. Bat. II. 770. N. brunelloides, O. Kuntze Revisio I. 493; Lindau in Engl. & Prantl Pflanzenfam. IV. 3 B, 289, t. 110, fig. c.

Kedah: Ridley 8312. Penang: Curtis 50, 1750; Deschamps. Pahang: Ridley 2181.—Distrib. In warm regions of both hemispheres.

The innovations are often densely white-hairy; there are also often long white hairs at the base of the flower. The var. β vestita, of Fl. Br. Ind. IV. 395 (which has large leaves, up to 8 to 10 in. long, on the branches), is frequent in Lower Burma, but there is no example of it from the Malay Peninsula.

3. STAUROGYNE, Wall.

Undershrubs, 6 to 24 in. (rarely 3 to 4 ft.) high, at base often woody, creeping, hairy (in S. subglabra nearly glabrous). Leaves opposite, equal, simple, entire; petioles usually long, rarely short, 25 to 5 in. Flowers in spikes (or spike-like racemes, the pedicels up to 15 in.), dense or lax; the spikes sometimes panicled. Bract usually a little longer than the calvx, sometimes considerably broader; two prophylla (often alternate), linear or nearly linear, a little shorter than the bract. Calyx 15 to 6 in. long, divided nearly to the base into 5 narrow persistent segments (often called sepals); of these one is often longer and sometimes much broader than the others. Corolla 5 to 1 in. long, tubular-campanulate, rather narrow; limb of 5 short rounded segments (often colorate). Stamens 4 didynamous, fertile; filaments sparsely hairy, and with gland-tipped hairs near the top; anthers of 2 ellipsoid cells, ultimately divaricate; pollen globose, with three longitudinal bands not reaching the poles, 25 to 30 μ in diam. Ovary oblong, surrounded at base by a disk, glabrous or rarely with minute scattered hairs; style long, sometimes with a few hairs in the lower part; branches 2, unequal. Capsule oblong, 2 to 25 in. long, ovoid at base, acute at top, glabrous or sometimes slightly minutely hairy, 2-celled, separating loculicidally into 2 valves, bearing seeds from the base; seeds 12 to 20 in each capsule, in vertical rows on the edges of the carpellary leaves. Seeds attached on very small papillæ, not on retinacula, short-ellipsoid, 400 μ long, yellow-brown ultimately black, smooth, more or less reticulate, minutely pitted.—Distrib. Species 40 in South-East Asia, 10 in Brazil.

Some of the Brazil species have flowers and capsules considerably larger than in the Asiatic species. The Asiatic species are so uniform in the corolla, stamens, and pistil—even down to the hairs thereon—that these are not described for the subjoined Malay species, which are separated mainly by characters of the bracts and calyx.—The posticous stigmatic lobe (both in the type species S. argentea, and in some others) is occasionally somewhat 2-lobed.

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Calyx ·3 to ·7 in. long:
  Sepals awned or with a stiff mucro:-
    Fruit-spikes 1 to 2 in. long :-
      Spike in fruit ovoid; leaves 2.5 in. long
                                                              .. 1. S. setigera.
      Spike in fruit oblong; leaves up to 4 to 5 in. long
                                                                  2. S. lanceolata.
    Fruit-spikes 2 to 3.5 in. long: -
      Awn of sepals with long several-celled hairs...
                                                                  3. S. malaccensis.
      Awn of sepals hardly microscopically scabrid
                                                                  4. S. angustifolia.
    Fruit-spikes 4 to 10 in. long:-
      Awn of sepals hardly microscopically hairy ...
                                                              .. 5. S. Kingiana.
      Awn of sepals with short spreading hairs ...
                                                              .. 6. S. longifolia.
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Sepals acute, hardly awned:-
    Leaves at tip acute or subacute :-
      Spikes in fruit rather dense, often recurved ...
                                                                  7. S. comosa.
      Inflorescence of one poor terminal panicle ..
                                                                  8. S. pauper.
      Spikes in fruit long, very lax, panicled :-
        Bracts and calyx with short hairs
                                                                  9. S. elongata.
        Bracts and calyx viscous, with gland-tipped hairs
                                                              .. 10. S. lasiobotrus.
    Leaves at tip rounded; bracts elliptic, obtuse ...
                                                              .. 11. S. Griffithiana.
  Sepals with linear obtuse tip:-
    Leaves elliptic obtuse; sepals hairy
                                                              .. 12. S. arcuata.
    Leaves lanceolate-acute; sepals glabrous
                                                              .. 13. S. subglabra.
Calvx .125 to .175 in. long:-
  Corolla ·6 in. long:-
    Leaves with triangular obtuse tip, upper surface pubescent 14. S. merguensis.
    Leaves lanceolate-acuminate, upper surface glabrate
                                                              .. 15. S. racemosa.
  Corolla 1 in. long
                                                              .. 16. S. macrantha.
  Corolla .75 in. long; leaves serrulate
                                                               .. 17. S. serrulata.
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1. STAUROGYNE SETIGERA, O. Kuntze Revisio I. 497 (1891). weak herb, 4 to 12 in. long, often branched or decumbent. pubescent, usually rusty upwards. Leaves 2.5 by .75 to 1 in.; tip triangular; base ovate or cuneate; mature nearly glabrous on both surfaces; petiole 25 to 5 in. long. Inflorescence of one terminal sessile head (a second on a short axillary peduncle sometimes added), ovoid, dense, 5 to 6 in. in diam., in fruit lengthening out to 1 in., rarely to 1.5 in. Sepals linear, very slightly unequal, the longest one ·4 in. long, linear, scarcely linear lanceolate; its awn with many patent short hairs, and also long several-celled scattered hairs, but no gland-Corolla ·6 in. long, from purple-pink to pink-white, headed hairs. nearly glabrous without in the bud. Ovary glabrous; style base with a few hairs. Capsule 2 in. long. Ebermaiera setigera, Nees in DC. Prodr. XI. 76; T. Anders. in Journ. Linn. Soc. IX. 451 (1867); C. B. Clarke in Hook, f. Fl. Br. Ind. IV. 398; Ridley in Trans. Linn. Soc., ser. 2, III. 332 (1893), and in Journ. As. Soc. Straits 121 (Singapore 1900). E. trichocephala, Mig. Fl. Ind. Bat. II. 774. E. subcapitata, C. B. Clarke in Bot. Tidskr. XXIV. 348 (Kjobenhaven 1902). Adenosma uliginosa var. \(\beta \) erecta, Nees in DC. Prodr. XI. 70; Miq. Fl. Ind. Bat. II. 771 partly (not of R. Br.).

MALACCA: Cuming 2355. PERAK: Scortechini; Wray 1878; Larút Perak, 500 to 800 ft., King's Collector 2192. Goping: King's Collector 1132. Pahang: Ridley 2178 (partly). Selangor: Curtis 2363; Kota Glanggi, fide Ridley.—Distrib. Common in Sumatra, also in Java, Borneo, Siam.

The dried specimens of this species are dusky green, often obscurely red-brown at top, the leaves sometimes whitened beneath. Kurz, in Journ. As. Soc. Beng. II.

78 (1870), united the three species, S. setigera, S. argentea, and S. lanceolata; they are undoubtedly very closely allied.

2. STAUROGYNE LANCEOLATA, O. Kuntze Revisio I. 497 (1891). Stem 6 to 14 in. high, erect, woody, undivided. Leaves 4 to 5 by 6 to 1 in. (or smaller), lanceolate or generally narrow-lanceolate, nearly glabrate on both surfaces. Inflorescence 1 in. long, in fruit 1.5 to 2 in. long, less dense than that of E. setigera, Nees. Bracts, prophylla, and calyx as of E. setigera, the longest sepal a trifle broader, linear-lanceolate at base. Corolla hairy without in the bud. Adenosma lanceolatum, Blume Bijdr. 756. Ebermaiera lanceolata, Hassk. Cat. Hort. Bogor. 147; Nees in DC. Prodr. XI. 76; Miq. Fl. Ind. Bat. II. 774 (not of C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 397). E. longifolia, Ridley in Trans. Linn. Soc., ser. 2, Bot. III. 332 (1893).

Pahang: Ridley 2177, 2178 (partly). Malacca: Derry 23.—Distrib. Java (Zollinger 591).

3. STAUROGYNE MALACCENSIS, C. B. Clarke. Herbaceous, 4 to 8 in. high, often branched. Stem hairy, often rusty at top, carrying 1 to 4, sometimes 8, spikes. Leaves up to 4 by 1 in., elliptic-lanceolate; base cuneate; mature with nearly glabrate surfaces; petiole 5 to 1 in. long. Heads 1 to 1.5 in. long, dense, in fruit lengthening to 2 to 3.5 in., lax, sometimes interrupted at base. Bracts oblong or elliptic-oblong, conspicuous, somewhat persistent. Sepals 4 in. long, conspicuously unequal, the larger one lanceolate or elliptic-lanceolate, acuminate, hardly awned, the other 4 nearly linear; tips of all the sepals with many, short, patent hairs and scattered, long, several-celled hairs. Corolla 6 in. long, nearly glabrous without. Ovary with scattered minute gland-tipped hairs in the upper half, which remain till the seeds are quite ripe. Ebermaiera argentea, Nees in DC. Prodr. XI. 76 (partly); T. Anders. in Journ. Linn. Soc. IX. 451 (1867). E. lanceolata, C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 397 (exclud. syn.) (not of Nees). E. Staurogyne, T. Anders. MS. in hb. Calcutta (not of Nees).

Kedah and Kasoom: Curtis. Penang: Curtis 1931. Malacca: Griffith 189; Ridley 1636. Province Wellesley: Ridley 6198.—Distrib. Java; Tenasserim.

The type Staurogyne argentea, Wall. Pl. As. Rar. II. 80 t. 186 (1831), is the common Khasia species, remote from the present, but (as Wallich says) very near S. angustifolia, Wallich. Staurogyne argentea, O. Kuntze (and of Lindau), includes probably S. argentea and S. angustifolia, but not S. malaccensis.

4. STAUROGYNE ANGUSTIFOLIA, Wall. Pl. As. Rar. II. 81 (1831). Stem 8 to 12 in. long, suberect, little divided, hairy, almost woody at

the base. Leaves glabrate on the surface; blade 3 to 4 by ·7 to 1 in., lanceolate, mostly narrowly lanceolate (but see the var. below), base attenuate, tip triangular, subacute; petiole 1 to 2 in. long. Spikes terminal and on short axillary peduncles, in flower ovoid or ellipsoid, dense, in fruit often 2 to 3 in. long. Bract narrow-oblong, aristate, with long hairs in the lower part. Calyx unequal, the largest sepal ·6 in. long, the base narrow-lanceolate, with long hairs; the awn long, somewhat rigid, glabrous or with minute bristles (less than 40 μ long); the other 4 sepals nearly linear. Corolla ·6 in. long, hairy without. Capsule ·2 in. long, thicker than in the neighbouring species. S. argentea, O. Kuntze Revisio I. 497 partim (1891) (not of Wall.). Ebermaiera angustifolia, T. Anders. in Journ. Linn. Soc. IX. 451 (1867); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 398; Prain Beng. Plants 798. E. Staurogyne β angustifolia, Nees in DC. Prodr. XI. 75.

Perak: Ridley 9766; Curtis. Malacca: Goodenough 1689.— Distrib. Mergui (Falconer 860), Tavoy (Wallich 4906).

- T. Anderson has written "E. angustifolia" on Falconer 860; but his name "angustifolia" (as well as Wallich 4906) may include other nearly allied forms. The true E. Staurogyne, Nees, is a Khasia species, in which the bract and sepals have no long several-celled hairs. This plant is put with S. longifolia, not with E. Staurogyne, by collectors. The leaves in all the examples seen have dried brown-red.
- 5. Staurogyne Kingiana, C. B. Clarke, n. sp. Stems 2 to 3 ft. high, pubescent. Leaves glabrous; blade up to $8\frac{1}{2}$ by 2 to 3 in., elliptic, narrowed at either end; main nerves 12 to 15 pair; petioles 1 to 2 in. long. Spikes 3 to 6 on a stem, terminal and on short axillary peduncles, 4 to 10 in. long, undivided, dense even in fruit. Bract linear, ·8 in. long. Sepals 5, nearly equal, linear, longest up to ·75 in. long, very little dilated at the base, sparsely hairy at base, glabrous or minutely scabrous in the upper half. Corolla 1 in. long, "yellowish-white, lower lip pale red" (collector's note), glabrous without. Stamens and pollen of the genus. Pistil glabrate. Capsule ·2 in. long, rather thick; the endocarp much thickened, almost corky. Allied to S. angustifolia, T. Anders.

Perak: on limestone hills, 500 to 800 ft. alt., King's Collector 10704; Goenong Panti, King's Collector 208. Pahang: Ridley 2176.

6. Staurogyne longifolia, O. Kuntze Revisio I. 497 (1891). Suberect, 8 to 30 in. high, hairy. Stem (in large examples) woody, robust below, and with erect branches. Leaves glabrous on the upper surface; blade 5 by 1 in., lanceolate, attenuate at either end (in the type example, but the leaves are frequently longer, and there are examples with shorter, broader leaves); petiole 1 to 1.5 in. long. Spikes short-peduncled at the end of branches and in the axils, short-oblong (often nodding) when

young, in fruit 2 to 5 in. long, somewhat dense, erect. Bract and calyx softly hairy, without long, fine, several-celled hairs; bract narrow-lanceolate, aristate, '6 in. long; sepals all linear, the longest one '5 in. long, including its awn '16 in. long, the awn hairy to the tip with spreading hairs varying in length, but all short. Corolla long, hairy without; tube nearly white, segments and mouth pink to purple. Pistil glabrate. Stamens and pollen of the genus. Capsule '2 in. long. Lindau in Engl. & Prantl Pflanzenfam. IV. 3 B, 288. Ebermaiera longifolia, Nees in DC. Prodr. XI. 76; T. Anders. in Journ. Linn. Soc. IX. 451 (1867); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 399; Ridley in Trans. Linn. Soc. ser. 2, III. 332 (1893).

Malacca: Cuming 2350; Lemann; Griffith (K.D.) 6079; Hullett 403. Perak: Scortechini 155; Wray 1302; Ridley 1604; alt. 300 to 800 ft., King's Collector 5821, 8678. Selangor: Ridley 7590. Negri Sembilan: Ridley 10098. Pahang: Tahan, fide Ridley.

This species is very close both to S. angustifolia and to S. comosa; the former differs by having the awns of the sepals glabrous or microscopically scabrous; the latter differs in that the sepals have lanceolate-linear soft tips, hardly awns.

7. STAUROGYNE COMOSA, O. Kuntze Revisio I. 497 (1891). 1 to 3 ft. high, almost woody below, hairy. Leaves: blade up to 8 by 3 to 3.5 in., cuneate at either end; upper surface glabrous, obscurely minute-granular-tuberculate; petiole 1 to 2.5 in. Spikes short, peduncled, undivided, dense, in flower 1 to 4 in. long, nodding, in fruit up to 5 to 7.5 in. long, often deflexed, rather dense (scarcely interrupted at base), softly hairy. Bract and sepals softly hairy, with long several-celled hairs; bract 4 in. long in Wallich's type (often longer), lanceolate-acuminate, point linear (hardly awned), with soft white hairs; sepals 3 in. long in Wallich's type (often longer), the longest (wider than the others) lanceolate with a linear soft-hairy tip. Corolla in the bud densely clothed with deflexed hairs without. Pistil glabrous. Stamens and pollen of the genus. Capsule 2 in. long. Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 288. Ruellia? comosa, Wall. Cat. 2414. Ebermaiera axillaris, Nees in Wall. Pl. As. Rar. III. 80, and in DC. Prodr. XI. 75; T. Anders. in Journ. Linn. Soc. IX. 452 (1867); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 399.

Penang: Wallich 2414. Perak: Scortechini 777; Wray 2192; Ridley 2893; 500 to 800 ft., King's Collector 10705; Larút, 100 ft., King's Collector 1834. Selangor: (Ridley) 7589, 8543, 10546.

King's Collector notes the calyx "velvety claret-coloured," the corolla "blue-white, darker inside." The corolla seems caducous, as the large well-collected material provides buds and fruit only. The type examples of Wallich from Penang

are unusually small specimens. This species is generally distinguishable from E. longifolia, Nees, by its much broader (elliptic) leaves.

8. Staurogyne pauper, C. B. Clarke, n. sp. Stem 18 in. long, undivided, glabrate, decumbent, woody at base. Leaves glabrate, with few scattered, white, adpressed bristles on the upper surface; blade 4.5 by 2 in. long, elliptic-lanceolate, acuminate, acute; base cuneate; petiole .25 to .5 in. long. Inflorescence of one terminal poor panicle, 3 by 1½ in., with few distant flowers; bracts .5 in. long, linear, soft, not awned. Sepals subequal, .5 in. long, linear, with soft hairs and many gland-tipped hairs. Corolla .6 in. long, pubescent without, "pale yellow with dark stripes" (King's Collector). Pistil of Staurogyne, glabrous except a few small hairs in the lower part of the style.

PERAK: alt. 200 ft., King's Collector 2832.

9. Staurogyne elongata, O. Kuntze Revisio I. 497 (1891). Slightly hairy. Leaves glabrate; blade 6 by 2 in., oblong-elliptic, cuneate at either end; nerves 8 to 10 pair, thin; petiole 2 to 3 in. long. Spikes up to 4 to 7 by 1 in., panicled, lax; pedicels often 175 in. long, with alternate prophylla. Bracts nearly 5 in. long, lanceolate-linear, with short white hairs, no gland-tipped hairs. Sepals 5, linear, the longest nearly 5 in. long, slightly widened at base. Corolla (buds) 4 in. long, scarcely pubescent without. Capsule 2 in. long, the upper half with scattered minute hairs. Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 288. Adenosma elongatum, Blume Bijdr. 757. Erythracanthus elongatus, Nees in DC. Prodr. XI. 78, var. β excl. Ebermaiera elongata, Nees in DC. Prodr. XI. 721, var. β excl.; T. Anders. in Journ. Linn. Soc. IX. 452 (1867); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 400 (not of Miquel).

Penang: Wallich (fide T. Anderson).—Distrib. Java.

The var. β of Miquel (here excluded) is *Ebermaiera debilis*, T. Anders. (in Journ. Linn. Soc. IX. 452, in note (1867)), a weak Philippine species. *E. elongata*, Miquel (Fl. Ind. Bat. II. 775), was (so Miquel says) = *E. Griffithiana*, T. Anders.; and, from Miquel's description, it must have been largely (or wholly) that species. As to *E. subpaniculata*, Hassk. (Retzia I. 77 (1855)), there are now here examples both of the Salak wild plant and of that cultivated at Buitenzorg; they may be varieties of *E. elongata*, Nees, but do not match it. The above description of *E. elongata*, Nees, is wholly from the Java type plant; no example from Penang has been seen.

10. Staurogyne lasiobotrys, O. Kuntze Revisio I. 497 (1891). Stem 18 to 20 in., suberect, hairy. Leaves glabrate; blade 5 by 1.5 in., oblong or elliptic-lanceolate, cuneate at either end, thin; petiole 1 to 3 in. long. Spikes up to 4 to 6 by 1 in., panicled, lax, softly viscous-hairy; pedicels often 16 in. long. Bracts 35 in. long, linear, with several-celled hairs ended by a coloured gland. Sepals 5, linear, the longest 35 in.

long, with several-celled gland-tipped hairs. *Corolla*, stamens, capsule as of S. elongata. *Ebermaiera lasiobotrys*, Nees in DC. Prodr. XI. 721; Wall. Cat. 9084; T. Anders. in Journ. Linn. Soc. IX. 452 (1867); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 400.

PERAK: Curtis 1350; King's Collector 8370 ("Flower dark-red tipped with pink"); Larút, 500 to 1000 ft., King's Collector 2292. Selangor: Ridley 7588.—Distrib. Moulmein, Mergui, Tavoy.

11. STAUROGYNE GRIFFITHIANA, O. Kuntze Revisio I. 497 (1891). Stem 4 to 8 in. long, creeping at base. Leaves (mature) shortly rather dense hairy on the upper face; blade 5.5 by 3 in. in Griffith's type (often smaller), roundly elliptic, very obtuse; base rounded or cordate (but cuneate in many examples); petiole .5 to 2 in. long. Inflorescence simple or branched; main spike 6 in. long in Griffith's type, lax, only slightly hairy. Bracts up to 5 in. long, elliptic, rounded, obtuse at top. Sepals 5, the longest 4 in. long, linear; tip linear-acute, not awned, with sparse short several-celled hairs not gland-tipped. (In the Perak example the sepals are linear-ligulate-obtuse at the tip.) Corolla 6 in. long, white, rarely tinged pink. Capsule 2 in. long. Erythracanthus Griffithianus, Nees in DC. Prodr. XI. 78. E. obtusus, Wight Ic. t. 1491 (not of Nees). Ebermaiera Griffithiana, T. Anders. in Journ. Linn. Soc. IX. 452 (1867); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 400; Ridley in Trans. Linn. Soc. ser. 2, III. 332 (1893), and in Journ. As. Soc. Straits 121 (Singapore 1900). E. elongata, Mig. Fl. Ind. Bat. II. 775 (mainly).

MALACCA: Griffith (K.D.) 6078; Goodenough 1509. SINGAPORE: Ridley; Hullett 613; G. King. Pahang: Ridley 2175. Perak: alt. 600 to 1000 ft., Scortechini 40; King's Collector 10335. Pahang: at Tahan, fide Ridley.

12. Staurogyne arguata, C. B. Clarke, n. sp. Stem 4 to 8 in. long, villous, woody, creeping. Leaves with scattered hairs above or glabrate; blade 4.5 by 2.5 in., ovate elliptic, tip triangular obtuse; base cuneate or sometimes rounded; petiole .5 to 1.5 in. long. Spikes often 2 or 3, lax, 2 to 4 in. long, arguate in fruit; bracts linear or sublanceolate, .5 in. long, hairy. Sepals subequal, .5 in. long, linear or very narrow-ligulate, hairy, tip subobtuse. Corolla .6 in. long, pubescent without, red (Wray). Capsule .2 in. long.

Perak: Scortechini 456, 728; Wray 48, 694; Ridley 2892.

13. Staurogyne subglabra, C. B. Clarke, n. sp. Nearly glabrous. Stem 6 to 12 in. Leaves glabrous, the upper surface sometimes obscurely puberulous; blade 4.5 by 1 to 1.25 in., lanceolate or broad-lanceolate, subacute; base cuneate; petiole .5 to 1 in. long. Spikes often 2 to 4, very loose, up to 3 to 5 in. long; the rachis microscopically scabrous;

bracts '5 in. long, linear, or the lower ones oblong. Sepals subequal, '5 in. long, linear, or scarcely oblong-linear, subobtuse, glabrous, almost shining. Corolla '6 in. long, very white (King's Collector). Capsule '2 in. long.

Perak: Scortechini 5386, 406; Ridley 5514; Curtis, alt. 3500 to 4000 ft.; King's Collector 8427.

This species is very similar to *E. arcuata* in all essential points; the two characters of hairy sepals with elliptic obtuse leaves, and glabrous sepals with lanceolate leaves, are, however, concomitant throughout the ample material.

14. Staurogyne merguensis, O. Kuntze Revisio I. 497 (1891). Stem 4 to 8 in. long, creeping at base, pubescent. Leaves minutely pubescent on the upper surface; blade up to 5 by 2·5 in. (much smaller in Helfer's type); tip obtusely triangular; base nearly always cordate; petiole ·5 to 1·5 in. long. Spikes usually peduncled, often paniculate, 2 to 3 in. long, very lax, thin. Bracts scarcely ·25 in. long, linear-lanceolate or linear. Sepals 5, subequal, united at the base, ·125 to ·175 in. long, linear, hispid. Corolla ·6 in. long, light blue or violet and white, pubescent without. Capsule ·25 in. long. Ebermaiera merguensis, T. Anders. in Journ. Linn. Soc. IX. 452 (1867); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 402.

Perak: Wray 3966; Scortechini 285, 1356, alt. 400 to 600 ft.; King's Collector 8284; Wray 4158. Trang: Goldham. Kedah: Curtis.—Distrib. Mergui.

This species in habit much resembles *E. incana*, and there is little to separate it except the small bracts; the hairs on the upper surface of the mature leaves are similar but smaller.

15. Staurogyne racemosa, O. Kuntze Revisio I. 497 (1891). Stem 1 to 2 ft. high, pubescent, creeping at base. Leaves glabrate, usually drying a red-brown; blade 4 by 1.25 in., broadly lanceolate, acuminate at either end; petiole .5 to 1.5 in. long. Spikes usually peduncled, simple or panicled, pubescent, up to 3 to 5 in. long, very lax; pedicels distant, exceedingly short; bracts lanceolate, hairy, .175 in. long. Calyx of 5 equal lanceolate lobes, .175 in. long. Corolla .6 in. long, white, tipped rose or purplish, pubescent without. Capsule .2 in. long, broad-oblong. T. Anders. in Journ. Linn. Soc. IX. 452 (1867); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 401; Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 288. Ruellia racemosa, Roxb. Fl. Ind. III. 42. Ebermaiera racemosa, Miq. Fl. Ind. Bat. II. 775. Erythracanthus racemosus, Nees in Wall. Pl. As. Rar. III. 80, and in DC. Prodr. XI. 78.

Penang: Wallich 2336; Stoliczka; Deschamps; Hullett 124; Maingay (K.D.) 1173; alt. 2000 ft., King's Collector; Curtis 406. Malacca:

Griffith. SINGAPORE: Walker 197. INDRAGERI: Curtis. — DISTRIB. Moulmein.

16. Staurogyne macrantha, C. B. Clarke, n. sp. Stem 3 to 4 ft. long, villous. Leaves glabrous, with a very few remote hairs on the upper surface; blade 4.5 by 1.75 in., elliptic-lanceolate, subacute; base cuneate; petiole 25 to 1 in. long, villous. Peduncles two, penultimate, 3 in. long, villous, carrying small few-flowered panicles; bracts 2 in. long, linear, very hairy. Sepals subequal, 175 in. long, linear, very hairy. Corolla 1 in. long, pubescent without.

PERAK: at Larut, alt. 4500 to 5000 ft., King's Collector 2417.

17. Staurogyne serrulata, C. B. Clarke, n. sp. Stem elongate, villous upwards. Leaves 4 to 5 by 1.75 in., elliptic, acuminate at either end; margin closely serrulate; both surfaces slightly pubescent; petiole .5 to 1 in. long, villous. Peduncles 4, from the penultimate axils, 4 in. long, villous; inflorescence 12- to 18-flowered, lax, pubescent; bracts hardly .125 in. long, linear. Calyx .125 in. long. Corolla .75 in. long, white, nearly straight, but the pedicels bent close under the calyx, so as to bring the corollas horizontal.

Perak: Ulu Batang Padang, Wray 1599; Scortechini.

4. CARDANTHERA, Voigt.

Herbs. Leaves opposite; upper toothed, rarely entire; lower frequently pinnatifid. Flowers in axillary clusters (in non-Malayan species running into terminal inflorescences); bracts and prophylla often obscure or 0. Sepals narrow, often unequal. Corolla nearly straight; tube shorter than the calyx; limb 2-lipped; lobes contorted in the bud. Stamens 4, fertile; anther-cells oblong; pollen globose, small, with numerous striæ converging to the poles. Capsule sessile, narrow, seedbearing from the base. Seeds 30 to 100, on small, straight, conic, soft funicles, hardly to be called retinacula (i. e. curved, rigid, pointed), glabrous or slightly glandular, i. e. not clothed with hygroscopic hairs.—DISTRIB. Species about 8 in India, 2 in Africa.

This genus should, according to Slater, be placed in the same Subfamily with Staurogyne, the pollen being identical in the two genera.

Cardanthera triflora, Voigt Hort. Sub. Calc. 482 (1845). Pube-scent, decumbent. Branches up to 1 ft. long. Leaves ovate, crenate-serrate, the lower (when in water) often pinnatifid. Flowers 1 to 3 in the axils; bracts 3 to 35 in. long, obovate; prophylla 25 in. long, oblong. Sepals linear, unequal, about as long as the bract. Corolla 35 to 5 in. long, purple and white. Capsule 25 to 35 in., pubescent; style thinly hairy. C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 405. Ruellia triflora,

Roxb. Hort. Beng. 46, and Fl. Ind. III. 52. Adenosma triflora, Nees in Wall. Pl. As. Rar. III. 79, and in DC. Prodr. XI. 68; T. Anders. in Journ. Linn. Soc. IX. 454 (1867).

SINGAPORE: fide C. B. Clarke (in Hook. f. l. c.).—DISTRIB. Abundant in Bengal, extending to Pegu.

I do not find now in the Kew Herbarium any example of this from Singapore; it is nearly sure to grow in the Malay Peninsula.

5. Hygrophila, R. Br.

Herbs, attaining 1 to 5 ft. high, more or less hairy. Stems quadrangular. Leaves opposite, equal, entire or crenate; the upper surface full of rhaphides. Flowers in continuous spikes or axillary clusters. Calyx ·25 to ·5 in. long, with 5 acute teeth, the lower half tubular in the bud, often with 5 lines of very thin tissue, and split deeply in the fruit; or 4-fid in H. spinosa. Corolla distinctly 2-lipped; lower lip trifid, the middle segment broader, emarginate. Stamens 4, didynamous, subsimilar, fertile (except in H. polysperma, where the two lower are filaments only or nearly obsolete); filaments glabrous or nearly so; anthers of two parallel subequal muticous cells; pollen globose, 15 to 35 μ in diam., with 12 to 18 longitudinal ribs. Ovary oblong, with 8 to 80 ovules; upper part of ovary and style more or less hairy; style with one linear branch, the other reduced to a small rudiment. Capsule 25 to 5 in. long, linear-oblong, seed-bearing from the base; seeds 8 to 80, ovoid, flat, 50 μ in diam., brown, nearly smooth on faces, shaggy, with hygroscopic hairs on margin.—DISTRIB. Species 40, in the warmer parts of the globe; these fall into three well-marked subgenera, the species of each of which are so closely allied as to be esteemed subspecies only by some competent botanists.

Subgenus 1. Hemiadelphis (genus), Nees. Unarmed. Flowers in terminal spikes:—

Fertile stamens 2:-

Bracts oblong or elliptic, as long as the calyx ... 1. H. polysperma. Subgenus 2. Eunygrophila. Unarmed. Flowers in distant axillary clusters:—

Leaves lanceolate acute or linear:—
Flowers in dense axillary clusters ...

.. 2. H. angustifolia.

Axillary clusters small, often 3- to 1-flowered . .

.. 3. H. saxatilis.

Leaves obovate or oblong, triangular or obtuse at tip:— Leaves oblong, all sessile or nearly so

.. 7. H. subsessilis.

Leaves, or at least lower leaves, petioled:—
Corolla ·25 to ·35 in. long

.. 5. H. meianthos.

Corolla · 5 to · 8 in. long:—
Capsule · 75 to · 8 in. long. Calyx sparingly hispid ... 4. H. quadrivalvis.
Capsule · 7 in. long. Calyx densely hispid ... 6. H. phlomoides.
Subgenus 3. Asteracantha (genus), Nees. Each whorl of axillary flowers with some strong spines, often an inch long, round it:—
Leaves sessile. Corolla 1 in. long ... 8. H. spinosa.

1. HYGROPHILA POLYSPERMA, T. Anders. in Journ. Linn. Soc. IX. 456 (1867). Small, procumbent, divided, sparingly pubescent. Leaves 1 by 5 in., oblong or elliptic, nearly entire; base narrowed or shortly petioled; upper surface full of rhaphides. Spikes terminal, 1 to 2.5 in. long, rather dense; bracts 25 to 35 in., elliptic; prophylla 25 in., lanceolate. Calux 25 in., divided nearly to the base; segments 5, linear, pubescent. Corolla 35 in. long, slender, pubescent, pale blue or white. Stamens 2; the two posticous filaments without anthers, sometimes nearly obsolete; anther-cells 2, oblong; pollen 25μ in diam., globose, with 12 to 16 longitudinal ribs. Ovary hairy towards the top; style hairy; stigma of one linear and one suppressed branch. Capsule ·25 to ·35 in. long, oblong, hairy towards the top. Seeds 20 to 32. orbicular, 40 to 50 \u03c4 in diam., flattened, brown, shaggy on the margin with hygroscopic hairs. Boiss. Fl. Orient. IV. 519; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 406; Lindau in Engl. & Prantl Pflanzenfam. IV. 3 B, 297; Prain Beng. Plants 801. Justicia polysperma, Roxb. Hort. Beng. 3, and Fl. Ind. I. 119. Hemiadelphis polysperma, Nees in Wall. Pl. As. Rar. III. 80, and in DC. Prodr. XI. 80; Wight Ill. t. 164B, fig. 3, and Ic. t. 1492; Griff. Notul. IV. 135; Mig. Fl. Ind. Bat. II. 776.

MALACCA: Griffith.—DISTRIB. Common throughout India; Kabul; Tonkin.

2. Hygrophila angustifolia, R. Brown Prodr. 479 (1810). Stems 2 ft. high, often decumbent at base. Leaves ·3 by ·7 in., lanceolate, attenuate at either end, subentire, glabrate; upper surface with many rhaphides; petiole ·25 in., sometimes ·5 in. long. Flowers in distant axillary dense clusters; bract ·25 to ·35 in. long, elliptic; prophylla scarcely ·25 in. long. Calyx ·35 to ·5 in. long; lobes in flower hardly half as long as the tube, triangular-linear, densely clothed with conspicuous rhaphides, sparsely hispid or nearly glabrous. Corolla ·5 to ·7 in. long, pale purple. Stamens 4, fertile; anther-cells 2, oblong, muticous, at equal height; filaments glabrous; pollen 25 μ in diam., globose, with 12 to 16 longitudinal ribs. Style hairy; stigma of the genus. Capsule ·5 to ·7 in. long, a little exceeding the calyx, 20- to 28-seeded. Nees in DC. Prodr. XI. 91; Benth. Fl. Austral. V. 545; Ridley in Trans. Linn. Soc. ser. 2, III. 333 (1893). H. salicifolia, Nees in Wall. Pl. As. Rar. III. 81, and in DC. Prodr. XI. 92; Wight

Ic. t. 1490; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 407; Hemsl. in Journ. Linn. Soc. XXVI. 237 (1890); Lindau in Engl. & Prantl Pflanzenfam. IV. 3 B, 297; Ridley in Journ. As. Soc. Straits 121 (Singapore 1900); Prain Beng. Plants 801. H. lancea, Miq. in Ann. Mus. Bot. Lugd.-Bat. II. 123 (1865–66). Ruellia salicifolia, Vahl. Symb. III. 84; Roxb. Fl. Ind. III. 50.

Selangor: Curtis 2365. Pahang: Ridley 1213. Pekan and Kelantan: fide Ridley.—Distrib. From South India to China and Japan.

The description above is taken from Wall. Cat. 2373 A, which is Nees' "type" of Hygrophila salicifolia. The Selangor example differs from this in having the capsules '8 in. long, in which point it resembles H. quadrivalvis, Nees, below. T. Anderson esteemed the whole of the species in the present section to constitute but one polymorphic species (Journ. Linn. Soc. IX. 456 (1867)). They are described here shortly only, with reference to their differences from H. salicifolia, Nees, taken as the standard form.

3. Hygrophila saxatilis, Ridley in Trans. Linn. Soc. ser. 2, III. 333 (1893). Small, rigid, branched, 6 to 14 in. high. Leaves approximated, 1 to 1.5 by .175 to .2 in., linear, entire, nearly glabrous. Flowers in small axillary clusters, usually only 3 to 1 together. Corolla .35 to .5 in. long, hardly smaller than that of H. salicifolia, white without, violet within. H. pusilla, Blume Bijdr. 804?

Pahang: Ridley 2179. Perak: Scortechini; alt. 300 ft.; Wray 3319, 3489; Curtis. — Distrib. Ceylon (Thwaites 3109); Borneo;

Philippines.

4. Hygrophila quadrivalvis, Nees in Wall. Pl. As. Rar. III. 80 (1832). Stems stout, often 3 to 4 ft. long. Leaves with an obovate triangular or obtuse tip; obovate rather than lanceolate, often crenulated in the upper half. Calyx exactly as of H. salicifolia. Corolla 7 to 8 in. long. Capsule 75 to 8 in. long, often numerous in the whorl, very erect. Nees in DC. Prodr. XI. 89; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 408; Ridley in Journ. As. Soc. Straits 121 (Singapore 1900); Prain Beng. Plants 801, 802. H. obovata, Wight Ic. t. 1489.

Penang: Deschamps; Curtis 1757; Durian S.B., King's Collector 368 (flowers white). Malacca: Griffith; Maingay 1979 (Kew 1178). Singapore: Lobb 57; Kurz; Hullett 231. Perak: Scortechini 64, 84, in salt swamps; Wray 2506; Mekong, Scortechini 1099; Durian S.B., King's Collector 364.—Distrib. India, common, especially near

the sea; Java, Borneo, Tonkin.

5. Hygrophila meianthos, C.B. Clarke, n. sp. Leaves obovate, 2 in. long, nearly glabrous. Bract less than 25 in. long, oblong. Calyx

·25 in. long, divided half-way down; teeth sparsely white-hispid. Corolla (expanded) ·25 to ·35 in. long. Anthers small, round. Capsule scarcely ·35 in. long. H. salicifolia var. assurgens. C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 407 (partly).

MALACCA: Maingay 3002 (K.D. 1177).

The examples are good with numerous flowers and ripe fruits, and appear "normal" in all respects.

6. Hygrophila phlomoides, Nees in Wall. Pl. As. Rar. III. 80 (1832). Stems often very hairy. Leaves 2 to 4 in. long, obovate; tip triangular, rarely subacute. Calyx divided half-way down; teeth densely white-hispid, so that the whorls resemble somewhat those of Phlomis; otherwise as H. quadrivalvis. Miq. Fl. Ind. Bat. II. 779. H. phlomoides, Nees in DC. Prodr. XI. 90; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 408; Prain Beng. Plants 801, 802. H. hirsuta, Roxb. Fl. Ind. III. 51. H. phlomoides, Wall. Cat. 2376.—Rheede Hort. Mal. II. 89, t. 46.

Penang: Deschamps. Singapore: Ridley 3612 a. Selangor: Ridley 8547, 10499. Perak: Scortechini 620, 1106, alt. 200 ft.; Wray 1748, 2432.—Distrib. India (common), Tonkin, Borneo.

Var. β Roxburghii, C. B. Clarke in Hook, f. Fl. Br. Ind. IV. 408. Smaller, often procumbent and more divided. Leaves 1 to 2 in. long, often scabrid, pubescent. Prain Beng. Plants 801, 802. H. obovata, Griff. Notul. IV. 134 (not exactly that of Nees). Ruellia obovata, Roxb. Fl. Ind. III. 51.

Penang: Deschamps.—Distrib. Chittagong, Pegu, Mergui, Philippines.

I do not see how this var. differs from H. radicans, Nees in Wall. Pl. As. Rar. III, 81, and in DC. Prodr. XI. 92.

7. Hygrophila subsessilis, C. B. Clarke, n. sp. Stem, leaves and inflorescence with brown hairs. Leaves 1.5 by 4 in., oblong, obscurely obovate; tip triangular; base narrowed; nerves beneath conspicuous; petiole, even in the lower leaves, 0 or hardly any; otherwise as H. salicifolia.

MALACCA: Harvey.

This resembles some forms of *H. undulata*, Blume, in which, however, the brown hairs are not present, and the lower leaves are petioled.

8. Hygrophila spinosa, T. Anders. in Thwaites Enum. Pl. Zeyl. 225 (1864). Stems stout, 2 to 5 ft. high. Leaves 3 to 6 in. long, lan-

ceolate to linear, hispid, sessile. Flowers clustered in the axils, 4 to 6 of the outer bracts being strong spines an inch long. Bract 5 to 1 in. long, lanceolate. Calyx 35 to 5 in. long, divided nearly to the base into 4 lanceolate lobes, one of which is broader and sometimes emarginate. Corolla 1 in. long, pale purple. Anthers and pollen of the genus. Capsule 35 in. long, linear-oblong, 4- to 8-seeded from the base. C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 409; Burkill in Dyer Fl. Trop. Afr. V. 31; C. B. Clarke in Dyer Fl. Cap. V. 11 (with all syn.); Prain Beng. Plants 802; H. longifolia, Kurz in Journ. As. Soc. Beng. 1870, II. 78 (non Nees). Asteracantha longifolia, Nees in Wall. Pl. As. Rar. III. 80, and in DC. Prodr. XI. 247; Wight Ic. t. 449; Miq. Fl. Ind. Bat. II. 811; Lindau in Engl. & Prantl Pflanzenfam. IV. 3 B, 297. A. auriculata, Nees in DC. l. c. 248.

SINGAPORE: King's Collector 249.—DISTRIB. Abundant in India and Africa.

Hygrophila longifolia, Nees (in Mart. Fl. Brasil, IX. 22 (1847)), is a totally different plant; for this cause T. Anderson, when he transferred Asteracantha longifolia to Hygrophila, gave it the new name H. spinosa. Nevertheless, some botanists call the Asiatic Asteracantha by the name H. longifolia, thereby causing great confusion.

6. Nomaphila, Blume.

Inflorescence in numerous 1-sided, open, axillary racemes shorter than the leaves. Bract (and prophylla) inconspicuous, linear, or wanting. Calyx even in the bud deeply divided (two-thirds or three-fourths of the way down) into 5 lobes. Otherwise as Hygrophila.—Species 14, viz. 8 in South-east Asia, very closely allied, and 6 in Tropical Africa.

This genus is in essentials *Hygrophila*, and is sunk in *Hygrophila* by both Lindau and Burkill, but is easily distinguished from it, whether estimated a genus or a subgenus.

1. Nomaphila stricta, Nees in DC. Prodr. XI. 84 (1847). Nearly glabrous, drying a black-green. Stems 3 ft. Leaves: blade 3 to 4·5 in. long, narrowly elliptic, attenuate at either end; midrib beneath with fine patent hairs; petioles up to 2 to 3 in. long. Corymbs in many axils, 2 to 4 in. in diam., recurved in fruit; peduncles less than 1 in. long; pedicels nearly glabrous; bract and prophylla linear, inconspicuous or 0. Calyx·25 to ·35 in. long, divided nearly to the base; segments 5, linear, glabrous or minutely scabrous or hispid (not viscid or glandular-hairy). Corolla ·5 in. long or more, bright blue. Filaments glabrous; pollen 20 μ in diam., globose, with 12 to 16 longitudinal ribs. Ovary and style pubescent. Capsule ·35 to ·6 in. long;

seeds small, ovoid, flattened, brown, shaggy on the margin, with hygroscopic hairs. C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 409. Justicia stricta, Vahl Symb. II. 6. Cryptophragmium axillare, Nees in DC. Prodr. XI. 96, cf. Vidal Phanerog. Cuming. Philipp. 61 in nota, 132. Hygrophila stricta, Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 297 (non Hassk.).

Perak: King's Collector 367; Curtis 3152; Wray 4256; Scortechini. Johore: Ridley 4173, 11133.—Distrib. Borneo, Philippines.

Nees himself, in DC. Prodr. XI. 722, united this species to N. corymbosa, Blume Bijdr. 804 (1825); the latter is (when dried) a smoky grey-green; the pedicels and calyx have viscous (and often glandular) hairs. The two are very close together.

2. Nomaphila minor, C. B. Clarke, n. sp. Smaller in all its parts than N. stricta. Leaves: lamina scarcely 2 in. long. Corymb-branches slender, glabrate. Corolla ·25 to ·35 in. long. Anthers and pollen smaller. Capsule ·25 to ·35 in. long. N. stricta (partim), C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 409. Ruellia? paniculata, Herb. Rottler.

PERAK: Scortechini 1374.—The example in Herb. Rottler is without locality.

7. RUELLIA, Linn.

Herbs or undershrubs. Leaves opposite, subequal, entire; upper surface with rhaphides. Flowers axillary (or panicled in American species); bract 0; prophylla spathulate or subfoliaceous, exceeding the calyx. Calyx deeply 5-fid; segments subequal, linear. Corolla tubular-ventricose, blue to white; lobes rounded, twisted to the left in the bud. Stamens 4, didynamous; filaments glabrous; anthers of 2 oblong, subequal, parallel, muticous, glabrous cells; pollen globose, large (30 to 50 μ in diam.), honeycombed. Ovary glabrous; ovules 3 to 10 in each cell; style hairy, with one linear branch, the other obsolete. Capsule clavate; base solid, sterile; top ellipsoid or subglobose, with 6 or more close-packed seeds; retinacula large, hooked. Seeds ovoid, flattened, hygroscopically shaggy on margin.—Species 150 (Bentham) or 200 (Lindau), in the warmer parts of the world, more abundant in America.

But a considerable number of the species reckoned in Ruellia by Lindau have not "wabenpollen" (honeycombed pollen), but "stachelpollen" (prickly pollen); so that the species left in Ruellia may not be more than 120 to 150, and possibly may be much fewer, if (as in the above diagnosis) the genus is restricted to those plants which have a stalked clavate capsule [Dipteracanthus (genus), Nees].

1. RUELLIA REPENS, Linn. Mant. 89 (1767) (not of Burm.). Sparingly hairy or glabrate. Stem 6 to 20 in., weak, often much branched.

Leaves 1 by ·35 to ·5 in., lanceolate, nearly always narrowed at the base, entire; upper surface sprinkled with rhaphides; petiole ·125 to ·2 in. Flowers axillary, mostly solitary; bract 0; prophylla spathulate or foliaceous, exceeding the calyx. Calyx ·2 in. long, divided nearly to the base into 5 subequal linear segments. Corolla ·75 in. long. Capsule ·5 in. long, contracted, sterile at the base; the seeds (usually 5 to 8) imbricated near the top. Blume Bijdr. 794; T. Anders. in Journ. Linn. Soc. IX. 460 (1867); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 412; Ridley in Trans. Linn. Soc. ser. 2, III. 332 (1893); Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 310; Hemsl. in Journ. Linn. Soc. XXVI. 238 (1890); Ridley in Journ. As. Soc. Straits, 121 (Singapore 1900). Dipteracanthus lanceolatus, Nees in Wall. Pl. As. Rar. III. 82, and in DC. Prodr. XI. 124; Miq. Fl. Ind. Bat. II. 782. D. subdenticulatus, Miq.! Journ. Bot. Néerl. I. 117 (1861). Rostellularia sarmentosa, herb. Buitenz.! (non Nees).

Penang: Curtis 1876. Malacca: Griffith. Singapore: Lobb; T. Anderson; Hullett; Ridley 2698, 10725. Kedah: Ridley 5750. Pahang: fide Ridley. Perak: Scortechini 1283.—Distrib. A common Malay plant, extending to Tenasserim on one side, to China and the Philippines on the other.

The plate of Burmann (Fl. Ind. t. 41, fig. 1) is good, and represents a plant not of the genus Ruellia. In the Addit. to Mant. 515 (1771), Linnæus says his Ruellia repens was Burmann, t. 41, fig. 1; it may be more correct to call this species R. repens, Blume. Nees, in DC. Prodr. XI. 370, says his Rostellularia sarmentosa had the capsule "4-seeded from the base," so that there is probably some error in the Rostellularia sarmentosa issued from Buitenzorg.

Var. β linearis, C. B. Clarke. Leaves 2·25 by ·2 to ·25 in. Pahang: Ridley 2182. IPOH: Deschamps.

Ruellia prostrata, Lam. Encycl. VI. 349 (cf. Hook. f. Fl. Br. Ind. IV. 411), differs a little from R. repens, Linn., by having larger flowers and capsules, and the leaves usually rather larger. In the Kedah example, Ridley, n. 5750, the flowers are more than 1 in. long, and the capsules more than 75 in. long; and Ridley has issued it as "R. prostrata"; the habit and small leaves are typical R. repens.

[R. angustiflora, Benth. & Hook. f. Gen. Pl. II. 1079 (R. angustifloia, Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 311), is a large-flowered American Ruellia, which appears to spread from gardens in Malaya; it was collected in Penang by Stoliczka, in Singapore by Deschamps and Hullett, n. 176.]

8. APORUELLIA, C. B. Clarke, n. gen.

Pollen with minute prickles or papillæ, or granulated; not honeycombed; otherwise as Ruellia.

To Aporuellia may be referred Ruellia flagelliformis, Hemsley; R. trichotoma, Nees; R. acaulis, R. Brown; R. spiciflora, Benth.; R. australis, R. Brown; R. Guppyi, Hemsley; and several other South-east Asian unnamed plants. Whereas all the Hindostan species of Ruellia have honeycombed pollen, the species of Aporuellia come from Malaya, South China, and Australia.

1. Aporuellia sumatrensis, C. B. Clarke, n. sp. Stem 11 in. high, with few or small leaves except at the base. Lower leaves: lamina 5 by 1·5 in., entire, sparsely puberulous; tip obtuse, triangular; base attenuated; upper surface dotted; the rhaphides obscure; petioles up to 1·5 in. long. Flowers in distant small clusters on long-peduncled spikes. Floral leaves passing into bracts, ovate or obovate, minutely pubescent, very variable in size. Calyx·175 in. long, divided rather more than half-way down; teeth 5, linear. Corolla·35 in. long; tube linear. Stamens 4, didynamous; anthers subsimilar, of two parallel muticous cells; filaments glabrous; pollen small, globose, 25 μ in diam., granular. Style hairy, one branch linear, the other nearly wanting. Capsule·6 in. long, seed-bearing from the base; seeds about 12, ovate, compressed, shaggy, with hygroscopic hairs on the margin.

Sumatra: R. Moesie, alt. 600 ft., H. O. Forbes 2636!

VAR. β Ridleyi, C. B. Clarke. Leaves more obovate than in the type, completely rounded at the top; flowers pure white (Ridley).

SELANGOR: Batu Caves, Ridley 8213; Kwala Lumpor, Curtis 2364.

2. APORUELLIA AXILLARIS, C. B. Clarke, n. sp. Branches (seen) 1 foot long, undivided; internodes 2 in. long. Leaves opposite, equal; blade 3·25 by 1·5 in., ovate-triangular, subobtuse, slightly hispidulous, suddenly attenuate at base; petiole ·25 in. long. Flowers in clusters of 1 to 3 in the axils, supported by oblong bracts ·25 to ·35 in. long. Sepals 5, linear, ·2 in. long, pubescent. Corolla ·8 in. long, narrowly-funnel-shaped. Stamens 4; anther-cells 2, parallel, oblong, obtuse at base; pollen globose, 45 μ in diam., papillose, subechinate. Capsule nearly ·5 in. long, stalked, with 7 flattened seeds in the clavate head.

MALAY PENINSULA: Songkah, Curtis.

This plant—in habit, leaves, inflorescence, corolla, capsule—simulates the very common Ruellia prostrata, Lam., var. dejecta; the pollen is unlike.

9. STENOTHYRSUS, C. B. Clarke, n. gen.

Inflorescence a terminal, peduncled, compound, many-flowered, nearly glabrous, subebracteate-linear panicle (8 to 12 by 75 in.); otherwise as *Hemigraphis*.

This genus agrees in character very closely with the Tropical African genera Mellera and Paulo-Wilhelmia, but the habit and hairs are very different.

1. Stenothyrsus Ridleyi, C. B. Clarke, n. sp. Upper leaf: blade up to 8 by 2 in., obovate-lanceolate, acuminate at either end, acute, nearly glabrous, entire, reticulate, full of rhaphides; main nerves 12 pair, oblique; petiole 1.5 in. long. Peduncle 1 to 4 in.; thyrsus interrupted at base, of 20 to 50 flowers, clustered in very small opposite cymes; bracts inconspicuous, setaceous. Calyx .175 in. long; sepals 5, linear, full of rhaphides. Corolla 1 to 1.5 in. long, blue; tube cylindric, narrow-campanulate in the upper half, minutely hairy. Stamens 4, subsimilar; filaments glabrous, connected in pairs; anthers long, of 2 linear-oblong cells at equal height, pubescent, minutely 1- to 2-mucronate at the base, connective mucronate at tip; pollen globose, 40 μ in diam., longitudinally 20-ribbed. Style thinly hairy, with one oblonglinear and one suppressed branch. Capsule (not ripe) narrowly ellipsoid, glabrate, seed-bearing from the base, with eight ovate flattened seeds.

PERAK: Tambun Loh, Ridley 9770; Ipoh, limestone rocks, Curtis 3149.

Ridley placed this plant close to *Strobilanthes*; the numerous capsules are all 8-seeded. There are, on one sheet, three thyrsi 8 to 12 by 1 in., and one thyrsus reduced (apparently accidentally) to a dense head.

10. Hemigraphis, Nees.

Herbs or undershrubs. Leaves opposite, subequal, often crenate, sometimes lobed; upper surface with rhaphides, which are sometimes altogether obscure. Flowers in terminal spikes, or rarely in 1- to 3-flowered small heads on axillary peduncles; bract usually exceeding the calyx, lanceolate or ovate; prophylla linear, short or 0. Calyx deeply 5-fid; segments lanceolate-linear or linear, subequal. Corolla tubular-campanulate, blue to white; lobes rounded, twisted in the bud. Stamens 4, didynamous; anthers of 2 oblong, subequal, parallel, muticous, glabrous cells; filaments glabrous, or the 2 longer with many long hairs; pollen rather large, from short-ellipsoid to oblong-ellipsoid; the 12 to 16 longitudinal ribs reaching to the poles; stopples 2. Ovary oblong, with 6 to 12 ovules, usually hairy at tip; style shortly hairy at base; stigma of one elongate and one suppressed lobe. Capsule oblong or linear-obovoid, slightly flattened, hardly stalked; seeds 6 to 12, ovoid, flattened, with much hygroscopic hair on the margin.—Species 30 perhaps, in South-east Asia and Polynesia.

To this genus belong Ruellia repanda, Linn.; R. Ravacensis, Nees; R. nemorosa, Zoll.; R. colorata, Nees; and, as Bentham says, most of Nees' first section of Ruellia.

Sect. 1. Flowers less than '75 in. long, 1 to 3 together in small short-peduncled heads 1. H. Ridleyi. Sect. 2. Flowers less than '75 in. long, in rather loose spikes:—

Sepals softly hairy, tips ligulate-triangular:—

Mature leaves nearly glabrate 2. H. confinis.

Mature leaves hairy 3. H. hirsuta.

Sepals with linear-subulate white-hispid tips:-

Capsule hardly 25 in. long, nearly terete .. 4. H. alternata.

Capsule more than 25 in. long, obovoid, flattened .. 5. H. platycarpos.

1. Hemigraphis Ridleyi, C. B. Clarke, n. sp. Branches (seen) 1 foot long, rambling or creeping, rooting, scabrid-pubescent with small suberect hairs. Leaves in equal opposite pairs; blade 2 by 1 in., ovate-elliptic, acute, crenate; upper surface with few scattered several-celled bristles (few of these bulbous at base), and with many conspicuous rhaphides; petioles ·25 to ·35 in. long. Flowers 1 to 3 in small heads on axillary peduncles ·175 to ·25 in. long; bract oblong ·35 in. long; bracteoles (prophylla) linear, hardly half as long as the calyx. Calyx ·175 in. long; sepals lanceolate-linear, with several-celled white hairs. Corolla ·5 in. long. Stamens and anthers of the genus; filaments with long white simple hairs; pollen 60 by 30 μ, with 12 to 16 ribs and two large stopples. Ovary oblong, 8-ovulate, glabrous, but hairy at the top. Style slightly hairy at the base; one stigmatic branch elongate, the other suppressed. Capsule not seen.

Pahang: Ridley 2180 (probably H. confinis, Ridley in Trans. Linn. Soc. ser. 2, III. 332 (1893)).

This is allied, in inflorescence and habit, to $Hemigraphis\ ravacensis$ (Nees sub Ruellia).

2. Hemigraphis confinis, T. Anders. in Journ. Linn. Soc. IX. 463 (1867). Stem 2 feet, branching, pubescent. Leaves: blade up to 4 by 1·7 in., elliptic, narrowed at either end, obscurely crenate, mature a grey-green and nearly glabrous; rhaphides in the upper surface obscure; petiole ·25 in. long. Spikes 1 to 2 by ·7 in., continuous but rather loose; bract ·5 in. long, obovate or elliptic with triangular tip; prophylla linear, hardly half as long as the calyx. Calyx ·35 in. long, softly hairy; sepals ligulate upwards with triangular tip. Corolla ·5 in. long. Stamens of the genus; filaments nearly glabrous; pollen 50 by 30 μ, with 12 to 16 longitudinal ribs and no stopples. Ovary glabrous, except at the tip; style of the genus. Capsule ·25 in. long, slightly flattened, glabrous except at the tip, 8-seeded nearly from the base. C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 423. Ruellia confinis, Nees in DC. Prodr. XI. 148; Miq. Fl. Ind. Bat. II. 788.

Malacca: Cuming 2354; Griffith (K.D.) 6188; Hervey; Hullett; Maingay 1754, 3147, (K.D.) 1174.—DISTRIB. Borneo.

3. Hemigraphis hirsuta, T. Anders. in Journ. Agri.-Hort. Soc. Ind. N.S. I. 270 (1868). Hairy. Leaves (even fully mature) hairy beneath; the upper surface densely clothed by conspicuous rhaphides; otherwise as H. confinis, T. Anders. Justicia hirsuta, Vahl Symb. II. 3, Enum. I. 121. J. brunelloides, Lam. Illustr. I. 40. Nelsonia hirsuta, Roem. & Sch. Syst. I. 172.

MALACCA: Ridley 10759.—DISTRIB. Java, Borneo.

This may be esteemed merely a hairy var. of H. confinis, but was kept up by T. Anderson. There are several other Malay sp. of Hemigraphis very closely allied.

4. Hemigraphis alternata, T. Anders. in Journ. Linn. Soc. VII. 114 (1864). Stem 12 to 18 in., rooting near the base, pubescent. Leaves: blade 2·5 by ·75 to 1 in., narrowed at either end, obscurely crenate, mature, sparsely hispid-pubescent; upper surface sprinkled with rhaphides; petiole ·25 to ·5 in. long. Spikes ·5 to 1·5 in. long, loose; bract ·5 to ·7 in. long, oblong subacute, hispid on margins. Calyx ·35 in. long; sepals lanceolate with linear tips, lower part glabrate, densely covered with rhaphides; tips with some several-celled white hispid hairs. Corolla, stamens, ovary, as of H. confinis, T. Anders. Capsule scarcely ·25 in. long, very little compressed, not obovoid, with 10 to 12 seeds placed subequally along its whole length, glabrous except at the tip. Ruellia alternata, Burm. Fl. Ind. 135 (excluding tab. Rheedei). R. discolor, Nees in DC. Prodr. XI. 149. R. Blumeana, Nees in DC. Prodr. XI. 149; Miq. Fl. Ind. Bat. II. 789 (as to his var. (Zollinger 660) only).

Pahang: Ridley 2183 ("flower white"). Johore: Ridley 11129.— Distrib. Java, Sumatra.

Described from the Nees two types (Zollinger 343, 660) written up by his hand at Kew. Miquel's "R. Blumeana" (named by his hand, and the same plant issued as R. Blumeana from the Buitenzorg Garden) is Hemigraphis Decaisneana, T. Anders., a species that has the capsule hairy to the base, and the leaves tubercular-scabrous.

5. Hemigraphis platycarpos, C. B. Clarke, n. sp. Spikes longer, denser (than in H. Blumeana), with broader bracts, more softly hairy, less hispid. Capsule exceeding 25 in. long, linear-obovate, much flattened, with 8 seeds, sterile at the base; otherwise as H. Blumeana.

Pahang: Ridley 1408. Johore: Ridley 11128.

11. Endopogon, Nees.

Fertile stamens 2; otherwise as *Strobilanthes*.—Species 20, in South (or East) India, extending to Singapore.

This genus is hardly worth re-establishing as a split-off from Strobilanthes, but Lindau has introduced the point of "2 fertile stamens only" into his diagnosis of Pseudostenosiphonium; so that it is necessary either to call Endopogon a genus or to re-unite both in Strobilanthes. Strobilanthes is so very large that it is as convenient to treat it under 4 genera as under 4 subgenera.

1. Endopogon Ridleyi, C. B. Clarke, n. sp. Puberulous. Leaves opposite, unequal, up to 6 by 2 in., elliptic, acuminate at either end, subentire; upper surface with scattered rhaphides; petioles up to 1 in. long. Peduncles 0 to 7 in. long, one from each axil (i.e. in opposite unequal pairs), each carrying one green strobilate spike, pendent in flower, 1 to 1.5 in. long; bracts .75 in. long, elliptic, acute, almost papery, loosely but closely imbricate, adnate at the base. Flowers 2, sessile, under each bract, without prophylla. Calyx .125 in. long, 5-fid to the base; sepals pubescent, 2 lanceolate-linear, 3 linear. Corolla .25 in. long in the bud (perhaps not much longer when expanded), white. Stamens 2, fertile; filaments glabrous; pollen 60 by 40 \(\mu\), longitudinally ribbed. Ovary (and style) glabrous, with 2 ovules in each cell.

SINGAPORE: Stagmount, Ridley 5987, 11255.

Allied to S. adnatus, C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 436, which is an Endopogon.

12. STROBILANTHES, Blume.

Herbs or undershrubs. Leaves opposite, often very unequal, sometimes falsely alternate, crenate serrate or subentire; the upper surface usually full of rhaphides. Inflorescence various; the flowers often in heads or strobilate, sometimes solitary in lax panicles, sometimes in small clusters which are panicled; floral leaves prominent or small, persistent or caducous, often passing into true bracts ("deckblaetter") in the upper part of a spike; bracteoles (prophylla) 2, often similar to the sepals, or wanting (but in the axil of a bracteole a bud is sometimes to be found). Calyx of 5 (usually rather large) segments, subequal, divided nearly to the base in the Malay species. Corolla tubular-campanulate; lobes rounded, twisted in the bud. Stamens (fertile) 4, didynamous; anther-cells 2, muticous; pollen large, ellipsoid (rarely subglobose), with 16 to 20 (rarely few) longitudinal ribs and 2 stopples. Ovary oblong or ellipsoid with 2 ovules in each cell, sometimes stalked; style with one long branch, the other suppressed. Capsule oblong or

narrow-ellipsoid, short-stalked, 4-seeded, or in many species with only 2 seeds.—Species about 200, *i.e.* after the genera *Endopogon*, Nees, *Pseudostenosiphonium*, Lindau, and *Acanthopale*, C. B. Clarke, have been taken out; extending from warmer Africa to China and Australia.

Sect. 1. Heads capitate, occluded (except the corollas) between two erect persistent bract-like floral leaves:-Leaves scarcely hairy; bracts obtuse .. 1. S. Maingayi. Leaves pubescent; bracts produced in a strongly crenulate tip 2. S. bibracteatus. Leaves rufous-ciliate on margins; bracts with some rufous .. 3. S. hirtisepalus. Sect. 2. Flowers strobilate or in short heads, with conspicuous rufous hair :-.. 4. S. rufo-sepalus. Heads ovoid, '1 in. long; bracts '5 in. long, linear Heads strobilate, 2.25 in. long; bracts .7 in. long, spathu-.. 5. S. rufo-strobilatus. late-oblong .. Heads capitate, 1.5 in. long; bracts .75 in. long, linear .. 6. S. rufo-capitatus. Heads 2- to 3-flowered, very small; bracts 25 to 1 in. long, .. 7. S. rufo-pauper. spathulate Sect. 3. Flowers strobilate, with grey hairs .. 8. S. Dyerianus. Sect. 4. Flowers panicled; bracts caducous or inconspicuous:-Paniele 8 by 5 in.; the flowers in opposite distant parts .. 9. S. collinus. Panicle 6 by 1 in.; branches scarcely 25 in. long .. 10. S. pachyphyllus.

1. STROBILANTHES MAINGAYI, C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 448 (1884). Perennial, 2 to 4 ft. high, sparingly pubescent. Leaves opposite, often very unequal, the larger 3 by 1 to 1.25 in., crenulate, tip acuminate; midrib beneath minutely scabrid; surface beneath often microscopically furfuraceo-puberulous, rarely at all hairy; petiole 125 to 25 in., pubescent. Flowers 1 to 5, capitate, in an ovoid subsessile head enclosed by two ovate erect floral bract-like leaves; bract 1 by 25 in., quadrate-oblong, keeled, tip rather wide, subobtuse, crenate; prophylla similar to sepals. Sepals 4 in. long, glabrous, oblong-subacute, membranous. Corolla 2 in. long, white (so noted on several collections); tube long, narrow, funnel-shaped, linear at base. Stamens 4, fertile, subsimilar; anthers oblong; filaments glabrous, except sometimes 2 or 3 hairs close to the base; pollen ellipsoid, large (70 by 40 μ), with 12 to 16 longitudinal ribs and 2 stopples. Style with a few scattered hairs. Capsule (not seen in the type examples) oblong, 5 in. long, with 4 seeds, shaggy all over with hygroscopic hairs.

Penang: Maingay (K.D.) 1182; alt. 1800 to 2000 ft., Ridley 7167; King's Collector 1545, 1791. Kedah: Curtis 298. Perak: 3000 to 4000 ft., King's Collector 8316. Selangor: Kelsall 2004.

The "type" of S. Maingayi (K.D. 1182) has supplied neither flower nor fruit; the above description is taken largely from Curtis 298. In King's Collector 1545, the collector notes "flowers dark blue, white inside"; but I can find no difference between this n. 1545 and n. 1791 (noted as having white flowers) collected by the same collector in the same locality.

2. Strobilanthes bibracteatus, Blume Bijdr. 799 (1825). Rather more pubescent than S. Maingayi. Leaves often with scattered hairs on the surface beneath. Tips of the bracts produced, conspicuously toothed. Filaments, in their whole lower half, with long, deflexed several-celled hairs; otherwise as S. Maingayi. Miq. Fl. Ind. Bat. II. 801. Goldfussia bibracteata, Nees in DC. Prodr. XI. 174. Dicliptera? crenata, Miq. Fl. Ind. Bat. II. 844.

Perak: Maxwell's Hill, Ridley 5516; Wray 174, 1674; Scortechini 337, 1413.—Distrib. Java, Sumatra.

There is another closely allied plant collected in Sumatra (Forbes 1906), which differs little but by having the flowers "pale purplish blue." S. erosus, Nees in DC. Prodr. XI. 181, appears to be this species, as Nees suspected; but I have seen no authentic example of S. erosus.

3. Strobilanthes hirtisepalus, C. B. Clarke, n. sp. More hairy than S. bibracteatus. Leaves minutely rufous-hairy on the margins. Floral leaves (involucral bracts) with rufous hairs. Sepals linear, very hairy, with rufous several-celled hairs. Otherwise as S. bibracteatus.

PERAK: Larút, alt. 1000 to 1500 ft., King's Collector 2215; Scortechini 940.

4. Strobilanthes rufo-sepalus, C.B. Clarke, n. sp. Branches 18 in. long, rufous-hairy, procumbent, divided, rooting near the base. Leaves opposite, one about twice as long as the other, longer one 2.25 by .25 in.; elliptic-acuminate, crenate, sparsely hispid on the upper surface; rhaphides obscure; petiole .2 in. long. Heads 1 in. long, ovoid, few-flowered, terminal and axillary. Bracts linear, .5 in. long, with several-celled bright-rufous hairs. Sepals .35 in. long, linear-subulate, with several-celled bright-rufous hairs in the upper half. Corolla 1 in. long; tube campanulate from a short linear base. Stamens 4; longer filaments hairy in their lower half; pollen 50 by $30~\mu$, longitudinally ribbed. Style glabrous, except close to the apex of capsule. Capsule .35 in. long, glabrate, with 4 young seeds.

Penang: alt. 2000 ft., Ridley & Curtis 2761. Perak: Scortechini; Ipoh, Curtis.

This species is near Strobilanthes anamiticus, O. Kuntze Revisio, I. 498 (1891).

5. Strobilanthes rufo-strobilatus, C. B. Clarke, n. sp. Branches rufous-hairy, creeping, rooting at the base. Leaves opposite, nearly equal, 4 by 2 in., cuneate at either end, crenate, nearly glabrate on the upper surface; petiole '5 in. long. Heads strobilate, 2 to 2·5 in. long; bracts (floral leaves) prominent even to the top of the head, '7 by '25 in., narrowed at either end; bracts '5 in. long, linear-spathulate, densely rufous with several-celled hairs. Sepals '4 in. long, linear, rufous-hairy. Corolla 1·25 in. long; tube campanulate, curved; lobes "purple" (Scortechini). Stamens 4; filaments hairy. Ovary pubescent at the apex, 4-ovulate; pollen 70 by 40 μ , longitudinally multi-striate.

PERAK: Scortechini 225.

6. Strobilanthes rufo-capitatus, C. B. Clarke, n. sp. "Shrubby creeper, 6 to 8 ft. long." Branches rufous-hairy. Leaves subequal or very unequal, up to 8 by 3.5 in., cuneate at either end, crenate; upper surface nearly glabrate; petioles 35 in. long. Heads sessile or peduncled, 1 to 2 in. long, densely clothed with bright rufous several-celled long hairs; bracts (floral leaves) 75 by 125 in., linear, shaggy on the margin, with rufous hairs 125 in. long; bracts 25 to 35 in. long; rufous-hairy; sepals linear, 25 in. long, rufous-hairy. "Corolla white."

PERAK: alt. 2500 to 3000 ft., King's Collector 10935; Scortechini 568.

7. Strobilanthes rufo-pauper, C. B. Clarke, n. sp. Slender, procumbent, rooting at the nodes, pubescent. Leaves opposite, more or less unequal, up to 2 by 7 in., elliptic-lanceolate, crenate; upper surface nearly glabrous; petioles '125 to '25 in. long. Heads very small, 2- to 3-flowered; bracts (floral leaves) '25 to 1 in. long, very narrowly spathulate, sparingly or obscurely hairy; bracts '25 in. long, linear, more or less rufous-hairy. Calyx '2 in. long; sepals linear, pubescent, with long several-celled straight rufous hairs at the tips. Corolla 1 in. long, "blue" (Ridley), nearly straight, narrow-funnel-shaped. Stamens 4; filaments glabrous; pollen 70 by 40 \(\rho\), longitudinally ribbed. Ovary and style glabrous. Capsule with 4 hairy seeds.

Perak: Maxwell's Hill, alt. 3000 ft., Wray 4192; the Cottage, alt. 5000 ft., Ridley 5515.

8. Strobilanthes Dyerianus, Masters in Gard. Chron. ser. 3, XIII. 442 (1893). Shrubby, vagant. Leaves opposite, unequal, sessile; blade of the larger one up to 7 by 3 in., elliptic-lanceolate, subacute, crenulate, nearly glabrate, often auricled at the base. Peduncles axillary, 1 to 3 in. long, with scattered, small, ovate leaves (·75 in. long), each terminated by a strobilate spike 1 to 2 in. long, pubescent (without rufous hair). Bracts ·25 to ·35 in. long, round-obovate. Corolla 1·3 in. long, violet-blue, Stamens 4; filaments glabrous; anther-cells short-oblong;

pollen 50 μ long, 30 μ broad, with 12 to 14 strong longitudinal striations. Kew Bull. 1894, Append. II. 51; Hook. Bot. Mag. t. 7574.

PENANG: Curtis.

This may not be indigenous in the Malay Peninsula. A note of Curtis says "originally collected in Burma by Boxall."

9. Strobilanthes collinus, Nees in Wall. Pl. As. Rar. III. 86 (1832). Attains 4 ft. Leaves opposite, equal, up to 10 by 3 in., elliptic, acuminate at either end, serrate, nearly glabrous, clothed with rhaphides on both surfaces; petiole hardly 1 in. long. Panicles terminal, open, often 8 by 5 in.; the flowers sessile, distant, in opposite pairs along the pubescent branches; bracts narrowly obovate-oblong, obtuse, ·75 in. long, early falling. Sepals 5, subequal, ·25 in. long, linear, hairy. Corolla 1·5 in. long, narrow, tubular-campanulate, white tinged pink. Stamens 4; filaments hairy; pollen ellipsoid, longitudinally striate. Ovary and style pubescent. Capsule ·7 in., linear-oblong, pubescent; seeds 4, hairy. Nees in DC. Prodr. XI. 192; Miq. Fl. Ind. Bat. IV. 801; T. Anders. in Journ. Linn. Soc. IX. 476 (1867); C. B. Clarke in Hook, f. Fl. Br. Ind. IV. 465. Ruellia collina, Wall. Cat. 2343.

SINGAPORE: Lobb. Penang: Wallich 2343. Perak: alt. 2000 ft., Curtis 1313; alt. 300 to 800 ft., King's Collector 7271, 8490.

10. Strobilanthes pachyphyllus, C. B. Clarke, n. sp. Shrub, up to 4 ft. high. Leaves opposite, equal, 5·5 by 2 in., elliptic, obscurely obovate, acute at either end; under surface pubescent ("silvery grey" when fresh), densely clothed with rhaphides, obscurely crenate, remarkably thick, hard in texture; petiole 1·5 in. Panicle terminal, long-peduncled, 6 by 1 in.; lateral branches scarcely ·25 in. long. Sepals 5, subequal, ·25 in. long, linear, glabrous, full of rhaphides. Corolla 1·25 in. long, very narrowly tubular-campanulate, light-blue. Stamens 4; filaments hairy in the lower half; anthers oblong, muticous; pollen exactly globose, 40 μ in diam., 20-ribbed, 2-stoppled. Style thinly hairy.

PERAK: hill-top, Scortechini 1786; alt. 1600 to 2000 ft., King's Collector 7150.

The material represents the species imperfectly; it appears allied to S. collinus, Nees; the texture of the leaves is distinctive, and the globose pollen is very unusual in the genus Strobilanthes.

13. Acanthopale, C. B. Clarke, n. gen.

Pollen globose, echinate, without ribs; otherwise as Strobilanthes. Species 8, in tropical Africa with Madagascar; and many Indian.

Among the Strobilanthes to be removed to Acanthopale are S. lanceolatus, Nees; S. pulneyensis, C.B. Clarke; S. Zenkerianus, T. Anders.; S. Arnottianus, Nees;

- S. exsertus, C. B. Clarke; S. ixiocephalus, Benth.; S. Gardnerianus, T. Anders.; S. vestitus, Nees; S. laxus, T. Anders.; S. Hookeri, Nees; S. Andersonii, Benth.; S. bolamputtensis, Bedd.; S. acrocephalus, T. Anders.; S. radicans, T. Anders.; S. debilis, Hemsl.; S. divaricatus, T. Anders.; S. oliganthus, Miq.; S. japonicus, Miq.
- 1. ACANTHOPALE? MALASICA, C. B. Clarke, n. sp. Branch nearly round, glabrate, at the tip sparsely hairy. Leaves opposite, equal; blade 2.5 by 1 to 1.5 in., elliptic-triangular, nearly entire, scarcely pubescent; upper surface with rhaphides; tip hardly acute; base deltoid; petiole .25 in. long. Flowers in poor, axillary, sessile or short-peduncled spikes; floral leaves caducous, not seen; bract .5 in. long, linear-ligulate, glabrous; bracteoles (prophylla) .25 in. long, linear, glabrous. Sepals 5, equal, .25 in. long, linear, slightly hairy at the tips. Corolla .75 in. long at least, nearly glabrous. Stamens 4, perfect; filaments glabrous; anthers oblong, muticous, parallel, at equal height; pollen globose, 50 \(\mu\) in diam., with bluntish spines, not ribbed. Ovary glabrous; style thinly hairy, one branch long, the other suppressed. Capsule .7 in. long, with a long sterile base; seeds 4, crowded in the globose head, hygroscopic-shaggy.

KEDAH: Lankawi Island, Ridley 8298.

The doubt as to the genus of this plant arises because the specimen is in such a state that I am not sure that the grain of pollen described may not have been a stray grain.

14. Acanthus, Linn.

Harsh glabrous shrubs. Leaves often prickly. Flowers showy, spiked; bract ovate; prophylla (bracteoles) 2 or 0. Calyx 4-partite nearly to the base; 2 inner segments much narrower than the 2 outer, subopposite. Corolla strongly 2-lipped; the posticous lip 0, i.e. truncated close to the base; anticous lip 3-lobed, nearly flat, blue or white; the mid-lobe bifid. Stamens 4, subsimilar; filaments glabrous. Anthers 1-celled, oblong, muticous, conspicuously fringed by white hairs; pollen ellipsoid, with 3 narrow longitudinal chinks. Ovary with 2 to 4 ovules in each cell. Capsule ellipsoid, woody, large, shining brown, 2- (rarely 4-) seeded; seeds discoid, without hairs.—Distrib. Species 8 or 10, extending from South Europe and Africa to Polynesia.

Stiff, erect shrubs :-

1. Acanthus illicifolius, Linn. Sp. Pl. 639 (1753). Shrub with many stout branches, 1 to 5 ft. high. Leaves 4 to 7 by 1 to 3 in.,

subpinnatifid, spinous, nearly sessile. Spikes 6 by 1.5 in.; bracts ·3 in. long, ovate; prophylla ·25 in. long, triangular-lanceolate. Calyx-segments; 2 outer subsimilar, ·5 to ·7 by ·3 in., round-ovate; 2 inner (alternate with the outer) shorter, much narrower. Corolla 1·25 in. long or more, blue. Capsule 1 by ·5 in.; seeds large, with close brain-like convolutions. Benth. Fl. Austral. IV. 548 (partly); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 481 (with syn.); Lindau in Engl. & Prantl Pflanzenfam. IV. 3 B, 319; Hemsl. in Journ. Linn. Soc. XXVI. 242 (1890); Prain Beng. Plants 800.

Penang: Deschamps, King. Malacca: Griffith. Singapore: Ridley 8097. Perak: Wray 2494, 2499; Scortechini.—Distrib. In saline mud, from Africa to Polynesia.

Var. β integrifolia, T. Anders. Axillary peduncles numerous, running into large terminal panicles; leaves elongate, lanceolate, entire or nearly so.—Distrib. Andamans.

2. ACANTHUS EBRACTEATUS, Vahl Enum. II. 75, t. 40 (1791). Bracts caducous; prophylla 0. Calyx ·3 in. long. Corolla ·75 in. long, white; otherwise as A. ilicifolius, Linn. C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 481; Lindau in Engl. & Prantl Pflanzenfam. IV. 3 B, 319; Ridley in Trans. Linn. Soc. ser. 2, III. 332 (1893), and in Journ. As. Soc. Straits 121 (Singapore 1900).

MALACCA: Griffith, Maingay 3084. PAHANG: Ridley 1276.—DISTRIB. Salt marshes, from the Andamans to Cochin-China and Java.

Bentham doubts whether this species is distinct from A. ilicifolius, Linn. Ridley n. 1276 is a typical example of A. ebracteatus, with flowers very much smaller than those of A. ilicifolius.

3. Acanthus volubilis, Wall. Pl. As. Rar. II. 56 t. 172 (1831). Twining, unarmed. Leaves oblong or elliptic, entire, glabrous. Spikes linear-oblong; prophylla 0. Corolla white, 1 in. long. Kurz For. Fl. II. 242; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 481; Ridley in Journ. As. Soc. Straits 121 (Singapore 1900). Dilivaria volubilis, Nees in Wall. Pl. As. Rar. III. 98. D. scandens, Nees in DC. Prodr. XI. 269.

Penang: Curtis 510. SINGAPORE: fide Ridley.—DISTRIB. Coast of India, Siam, Malaya, Australia.

The dried tips of the branches are difficult to separate from those of A. ebracteatus; the leaves are usually entire or slightly prickly; the flowers larger.

15. Gymnostachyum, Nees.

Herbs or undershrubs, sparingly pubescent. Leaves lanceolate to obovate, entire or crenulate, petioled. Panicle (in the Malay Peninsula

species) terminal, sometimes of several elongate branches; branches linear, with very small lateral cymes, or reduced to spikes; bracts linear, very small; prophylla hardly any. Calyx small, less than '2 in. long, divided deeply into 5 linear segments, pubescent or puberulous. Corolla '5 to 1 in. long; tube narrow; limb 2-lipped. Stamens 2; anther-cells 2, oblong, parallel, at equal height, muticous; pollen small, short-ellipsoid, longitudinally (often obscurely) ribbed. Ovary conic, many-ovulate, nearly glabrous; style at tip shortly 2-fid. Capsule '5 to 1 in. long, linear, glabrate, with parallel sides, 8- to 20-seeded from the base. Seeds ovoid, flattened, obscurely hairy. Species 25 to 30, in South-east Asia, North Australia, Polynesia.

This genus, varying in size, is distinguished by the linear (not clavate) many-seeded capsule. The small-sized group, *Gymnostachyum* proper, has (a) the flowers clustered or opposite (B) the flowers, solitary, alternate; but of the group (A) there is no example from the Malay Peninsula.

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Stems 1 to 4 in. long. Flowers solitary in long spikes:-
  Spikes linear, simple. Corolla blue, toward the base
  whitish:-
    Leaves suddenly narrowed on the winged petiole
                                                       .. 1. G. decurrens.
    Leaves spathulate on the petiole:-
      Corolla '75 in. long or more ...
                                                       .. 2. G. diversifolium.
  Spikes linear, somewhat branched; corolla white
                                                       .. 3. G. pallens.
Stem elongate; panicle with many long, linear branches .. 4. G. polyneuron.
Stems 1 to 3 ft. long; inflorescence terminal; bracts
minute; stamens, pollen, and style as of Gymnostachyum;
but the capsule is not known in any of the following
species: -
  Panicle 2 to 3 in. long, short-peduncled; flowers 8 to 20:-
    Spike slender, linear; style hairy
                                                      .. 5. G. simplicicaule.
    Spike denser; style glabrous:-
      Leaves with 5 to 6 pairs of nerves
                                                       .. 6. G. hirtistylum.
      Leaves with 9 to 11 pairs of nerves
                                                       .. 7. G. magis-nervatum.
  Panicle 8 in. long, usually branched :--
   Leaves not exceeding 2.5 in. in breadth :-
     Leaves thick, attenuate at either end ...
                                                     .. 8. G. knoxiifolium.
     Leaves elliptic, shortly acuminate:-
        Panicle with long branches
                                                       .. 9. G. ? Scortechinii.
                                                       .. 10. G. Ridleyi.
        Panicle linear, with short lateral cymes
    Leaves 6 in. wide ...
                                                       .. 11. G. ? magnum.
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1. Gymnostachyum decurrens, Stapf in Kew Bull. 357 (1894). Stem 1 to 4 in. high. Leaves up to 5 by 3 in., pubescent beneath, ovate; tip triangular; margin undulate; nerves 6 pairs, the lowest patent; base suddenly narrowed, often decurrent on the petiole. Spikes

linear, 4 to 7 in. long (5 on one stem); flowers all solitary; bracts minute, linear. Sepals hardly 15 in. long, linear, pubescent. Corolla 5 to 6 in. long, pubescent, blue. Stamens 2; filaments glabrous upwards; anther-cells 2, oblong, parallel at equal height, minutely or obscurely mucronate at base; pollen ellipsoid, 20 μ long, obscurely ribbed longitudinally. Ovary minutely pubescent; style thinly hairy, with one branch suppressed. Capsule 7 in. long, linear, glabrate, 20-seeded.

Pahang: Ridley.

2. Gymnostachyum diversifolium, C. B. Clarke, n. sp. Creeping. Stems 1 to 4 in. Leaves up to 5 by 2·25 in., slightly pubescent beneath, ovate; tip triangular; margin entire; nerves 8 pairs; base suddenly narrowed, shortly decurrent on the petiole, or (on every plant) one leaf truncate or cordate at base. Spikes linear, 2 to 5 in. long, 1 to 3 on one stem; flowers all solitary; bracts minute or none. Calyx scarcely ·15 to ·2 in. long. Corolla ·75 in. long or rather more. Otherwise as G. decurrens, Stapf.

KEDAH: Curtis 2530. PERAK: alt. 400 to 600 ft., King's Collector 8284, 936; Scortechini 1589.

In every plant the leaves are decurrent on the petiole; but there are one or two upper leaves truncate or even cordate at base; the same may be observed in several of these small Gymnostachyums. This plant is nearly allied to G. decurrens, Stapf; the leaves are of thinner texture, with thinner nerves.

3. GYMNOSTACHYUM PALLENS, C. B. Clarke, n. sp. Rhizome 1.5 in. long, woody, nodose. Stem .5 to 1 in. long. Leaves: blade 4 by 2.5 in., broad-ovate; tip subobtuse, nearly glabrous, shortly decurrent on the petiole; margin wavy-crenate; upper surface densely punctate; lower surface pale green. Spike 3 to 4 in. long, on a 3 to 4 in. peduncle, slightly branched, minutely pubescent; flowers solitary. Calyx .125 in. long. Corolla .5 in. long, white. Capsule rather more than .5 in. long.

PERAK: alt. 300 to 500 ft., King's Collector 8133.

4. Gymnostachyum polyneuron, C. B. Clarke, n. sp. Top of stem leafy, 3 in. long (seen). Leaves spathulate; blade ovate, 5 by 2·25 in.; tip triangular-obtuse, nearly glabrous; primary nerves 10 pairs; petioles 1·5 in. long. Panicle terminal, compound; ultimate spikes 2 to 5 in. long, linear; flowers distant, solitary, subsessile. Sepals ·125 in. long, linear, nearly glabrous. Corolla ·5 in. long; "lower lip deep violet, upper white splashed with violet." Stamens 2; anther-cells 2, narrow oblong, at equal height, not tailed; pollen ellipsoid, 30 μ long, with 2 stopples and 2 longitudinal rows on either side of each stopple. Ovary

nearly glabrous; style shortly 2-fid, thinly hairy in the lower half. Capsule 5 in. long, linear-oblong, glabrate, with 10 seeds.

SIAMESE STATES: Songkah, Curtis.

5. Gymnostachyum simplicicaule, C.B. Clarke, n. sp. Slightly pubescent. Stem 1 to 2 ft. long, undivided (in any example seen). Leaves: blade 3 by 1 in., elliptic, obtusely triangular at either end, entire; nerves 5 to 6 pairs, obscure; petioles ·25 to ·5 in. long. Panicle terminal, few-flowered, reduced almost to an oblong spike; peduncle hardly 1 in. long; bracts minute. Sepals hardly ·125 in. long, linear. Corolla hardly ·5 in. long, grey-yellow, 2-lipped. Stamens 2; filaments glabrous; anther-cells 2, narrowly oblong, parallel, nearly at equal height, muticous; pollen 30 by 15 μ, narrowly ellipsoid; stopples 2, longitudinally obscurely ribbed. Style upwards glabrous, very shortly bifid at tip.

Perak: alt. 3000 to 3500 ft., King's Collector 893, 935, 2394; Scortechini 688.

6. Gymnostachyum hirtistylum, C. B. Clarke, n. sp. Glabrate, the inflorescence pubescent. Stems nearly a foot high, simple, decumbent, rooting at the base. Leaves opposite, equal; blade elliptic-acute, 4 by 2 in., without rhaphides; base broadly cuneate; nerves 6 to 7 pairs; petioles 2 in. long. Inflorescence of 2 terminal, simple, linear, slender, interrupted, ebracteate spikes; peduncles 5 to 1 in. long; flower-clusters of 1 to 2 flowers, opposite, the lower pairs distant. Sepals hardly 125 in., linear. Corolla white, very small, with a short tube. Stamens 2; anther-cells 2, at equal height, not tailed; pollen very shortly ellipsoid. Style hairy; tip shortly bifid.

PERAK: alt. 400 to 600 ft., King's Collector 10814.

7. Gymnostachyum magis-nervatum, C. B. Clarke, n. sp. Almost glabrous. Stem 12 to 18 in., decumbent, rooting near the base, branched. Leaves opposite, equal; blade 3.5 by 1.3 in., elliptic-lanceolate, acuminate at either end; nerves 9 to 11 pairs, oblique; both surfaces with rhaphides, the lower also densely, minutely dotted; petioles 2 in. long. Peduncles terminal, hardly 5 in. long. Spikes 2.5 in. long, simple; flowers 12 to 20, opposite; bracts minute. Sepals hardly 1 in. long, lanceolate, nearly glabrous. Corolla 5 in. long, very narrow, creamcoloured, 2-lipped nearly half-way down. Stamens 2; filaments glabrous; anther-cells 2, rather large, oblong, at equal height, muticous; pollen 40 by 25 μ , with 10 strong longitudinal ribs. Pistil glabrous; ovules 8 or more.

Perak: alt. 100 ft., King's Collector 6542.

8. GYMNOSTACHYUM KNOXHFOLIUM, C. B. Clarke, n. sp. Nearly glabrous, except the minutely pubescent inflorescence. Stem erect, with long

internodes. Leaves: blade 6.5 by 2 in., broadly lanceolate, tapering at either end, texture thick, without rhaphides; nerves 7 pairs, springing very obliquely and curving inwards; petioles 25 in. long. Panicle of two branches; branch 8 in. long, linear, with small, opposite, distant cymes; bracts hardly 2 in. long, linear. Sepals 075 in. long, oblong-linear. Stamens 2; filaments glabrous, each with a minute tooth at base; anther-cells narrow-oblong, parallel at equal height, muticous. Ovary nearly glabrous, many-ovuled; style thinly hairy; tip minutely 2-fid. Buds very young; corolla noted white by collector.

NEGRI-SEMBILAN: King's Collector 10085.

9. Gymnostachyum? Scortechinii, C. B. Clarke, n. sp. Stem erect, at least 12 to 18 in. high. Leaves: blade 7.5 by 2.5 in., elliptic, acuminate at either end, entire; upper surface with rhaphides; lower minutely pubescent; petioles 5 to 1.5 in. long. Panicle very young, 8 in. long, with long branches, many-flowered, rusty-pubescent; bracts inconspicuous; flowers mostly in approximate opposite pairs. Calyx 125 in. long. Stamens 2; filaments glabrous at top; anther-cells 2, oblong, parallel, at equal height, acute-muticous at base; pollen 35 by 20 μ , with 2 stopples; a longitudinal row of patches (hardly tubercles) on each side of each stopple.

Perak: Scortechini.

The habit of this plant might do for a Gymnostachyum near G. venustum, T. Anders., but the genus is doubtful.

10. Gymnostachyum Ridleyi, C. B. Clarke, n. sp. A tall shrub. Leaves: blade 6 to 7 by 2·25 in., elliptic, shortly cuneate-acuminate at either end, pubescent beneath; petiole ·75 in. long, pubescent. Panicles (reduced almost to spikes) 2, terminal, 11 by ·75 in.; bracts ·125 to ·2 in. long, linear; flowers distant, solitary, or in 2- to 4-flowered lateral cymes on peduncles hardly ·15 in. long. Sepals ·15 to ·2 in. long, pubescent. Corolla white.

PERAK: Ridley 9772.

The example shows no corolla, no capsule.

11. Gymnostachyum? Magnum, C. B. Clarke, n. sp. A shrub. Stem glabrate; upper internodes 7 in. long. Leaves: blade up to 12 by 6 in., obovate, nearly glabrate, entire; nerves 12 (or more) pairs; upper petioles 3 in. long. Panicle terminal, 8 by '75 in.; bracts '15 to '2 in., linear; peduncle 1.5 in. long; small cymes 2- to 3-flowered in opposite approximate pairs. Sepals linear, '2 in. long, pubescent. Corolla in very young bud. Stamens 2; filaments glabrous upwards; anther-cells 2, parallel, oblong, at equal height, muticous.

MALACCA: Waterfall, Goodenough 1893.

From the size, habit, and stamens of this plant it is almost certainly either a Gymnostachyum or a Phlogacanthus.

16. Phlogacanthus, Nees.

Corolla-tube cylindric. Capsule narrowly ellipsoid, contracted close to the base; otherwise as Gymnostachyum.—Distrib. Species 12, in India; 1 or 2 extending a short way east.

1. Phiogacanthus brevis, C. B. Clarke, n. sp. A branched undershrub, 12 to 18 in. long. Leaves: blade 6 by 3.5 in., broadly ovate; tip subobtuse; base shortly attenuate; nerves 6 to 7 pairs; petiole 1 to 1.5 in. long. Panicles terminal, 2 to 4 in. long, oblong; bracts minute. Sepals .15 to .2 in. long, linear, minutely pubescent. Corolla small (only seen in bud), grey pubescent without. Stamens 2; anther-cells 2, oblong, parallel, at equal height, muticous; pollen 20 by 15 μ , longitudinally banded. Pistil glabrous. Capsule 1 in. long, nearly .2 in. wide upwards, subcylindric, obtuse, 8-seeded; base narrowed. Seeds flat, nearly .125 in. in diam.

Perak: alt. 300 ft., King's Collector 2884.

The capsule is here typically that of *Phlogacanthus*, and not the parallel-sided capsule of *Gymnostachyum*; but the two genera may be united.

17. Andrographis, Wallich.

Herbs or very small shrubs. Leaves entire. Racemes (or spikes) 1-sided, axillary and terminal, often compounded into loose panicles with spreading branches; bract very small, narrow; prophylla hardly any; flowers solitary or in few-flowered, distant clusters. Sepals 5, rarely more than 2 in. long, linear. Corolla small (about 5 in. long), 2-lipped; base tubular; limb white, spotted pink-purple in the palate. Stamens 2; filaments hairy; anther-cells 2, ovate, parallel, at nearly equal height; base acute (not spurred), with often a tuft of hairs; pollen $25~\mu$ long, short-ellipsoid, with few very slender longitudinal ribs. Style thinly hairy; tip minutely bifid. Capsule narrowly oblong, with parallel sides, seed-bearing nearly from the base, flattened from the back of the valves. Seeds 6 to 12, stony, cuboid-ellipsoid, smooth, glabrate, with rows of minute pits.—Distrib. Species 18, very closely allied, in India; 1 or 2 extending to China and Malaya.

1. Andrographis paniculata, Nees in Wall. Pl. As. Rar. III. 116 (1832). An erect annual, 1 to 3 ft. high. Stem quadrangular.

Leaves 2.5 by .5 to .75 in., lanceolate, glabrous, paler beneath; petioles .25 in. long. Panicle copious, of lax divaricate racemes; lower flowers in each raceme pedicelled, solitary. Capsule .75 by .125 in., nearly glabrous when mature. Nees in DC. Prodr. XI. 515; Wight Ic. t. 518; Miq. Fl. Ind. Bat. II. 855; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 501; Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 323; Prain Beng. Plants 809. Justicia paniculata, Burm. Fl. Ind. 9; Blume Bijdr. 788.

PENANG: Curtis 1877.—DISTRIB. Throughout India.

2. Andrographis tenuiflora, T. Anders. in Journ. Linn. Soc. IX. 502 (1867). Leaves: blade ovate, shortly acuminate, 2·5 by 1·5 in., obscurely puberulous; base shortly spathulate. Racenes (often nearly spikes) very slender, straggling. Corolla ·4 in. long. Otherwise as A. paniculata, Nees. Lindau in Engl. & Prantl Pflanzenfam. IV. 3 B, 323; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 502. Haplanthus tener, Nees in Wall. Pl. As. Rar. III. 115, and in DC. Prodr. XI. 512.

Kedah: Ridley 8331; Curtis 2136, 2578.—Distrib. Eastern India, Malaya.

18. Cystacanthus, T. Anders.

Shrubs or erect herbs. Leaves opposite, equal, entire. Inflorescence terminal (or axillary in some non-Malay species); panicles narrow; bracts small; prophylla 0. Calyx deeply 5-fid; segments narrow. Corolla rather large, tubular, curved and inflated, somewhat 2-lipped; segments ovate or oblong, one completely outside in the bud. Stamens 2; rarely 2 rudiments added; anthers of 2 oblong, parallel, muticous cells; connective often hispid on the back; pollen subglobose, with few longitudinal bands. Ovary with 4 or more ovules in each cell. Capsule linear, with parallel sides, many-seeded nearly from the base.—Distrib. Species 5, in India; 1 extending to Cochin-China.

1. Cystacanthus turgida, Nicholson Dict. Gard. I. 428 (1884). A glabrous shrub, 1 to 2 ft. high. Leaves: blade 4 to 7 in. long, oblong or narrow-elliptic, narrowed at either end; petioles 5 to 1 in. long. Inflorescence terminal; panicles 1 to 5 in. long, dense; flowers clustered on branches hardly 17 in. long; bracts inconspicuous, 15 to 2 in. long. Calyx-segments 125 to 2 in. long, linear. Corolla 1 in. long, white, pink-spotted; tube strongly bent close above the calyx and greatly inflated. Capsule 1 by 125 in., many-seeded, dorsally compressed. Seeds ovoid, flattened, densely hairy. Lindau in Engl. & Prantl Pflanzenfam. IV. 3 B, 325. Cystacanthus sp., Benth. in Benth. & Hook. f. Gen. Pl. II. 1098. Meninia turgida, Hook. Bot. Mag. t. 6043.

Penang: Deschamps.—Distrib. Burma, Cochin-China.

19. Asystasia, Blume.

Herbs or undershrubs. Leaves opposite, equal or nearly so. Racemes subterminal, unilateral, lax at base, sometimes compound; pedicels short (0 to 2 in. long), alternate or opposite, in bud and flower suberect; bract and 2 prophylla at base of the pedicel small bristles (hardly 125 in. long). Calyx 2 to 25 in. long, divided very nearly to the base into 5 linear or narrow-oblong segments. Corolla short or long; tube inflated upwards or linear; lobes 5, imbricated in the bud. Stamens 4, didynamous, all perfect; filaments united in pairs at the base, glabrous or slightly hairy near the base; anther-cells 2, oblong, parallel, at equal height, at base muticous or minutely auricled; pollen ellipsoid, longitudinally ribbed in the type species. Ovary hairy; style long, glabrous except near the base; stigmatic lobes 2 equal, hemiglobose; oyules in each cell 2. Capsule oblong, 4-seeded in the upper part; base contracted, sterile. Seeds compressed, round, often tubercled or rough, without hairs. Species 30, in Southeast Asia, and in Tropical and South Africa.

1. ASYSTASIA COROMANDELIANA, Nees in Wall. Pl. As. Rar. III. 89 (1832). A more or less dull-pubescent herb, 1 to 4 ft. high. Leaves from 1 to 3.5 in. long, ovate, triangular-acute at tip, entire, the margin undulate or sometimes obscurely toothed; petiole 25 to 1.75 in. long. Racemes 1 to 4 in. long, rarely divided (paniculate), on a peduncle 1 to 4 in. long. Sepals ·2 in. long, linear, pubescent. Corolla varying from lurid pale-purple to nearly white, 1 to 1.25 in. long (see however, remark on form β below); the contracted cylindric base of the tube much shorter than its inflated upper half. Pollen 75 by 45 μ , with 2 stopples, and longitudinal ribs beside each stopple. Capsule 1 in. long; solid cylindric base 35 in.; seeds 2 in. in diam., compressed, ovoid, wrinkled or subtubercular. Nees in DC. Prodr. XI. 165 (with syn. and var.); Miq. Fl. Ind. Bat. II. 792; Hook. f. Fl. Br. Ind. IV. 493 (with syn.); Dyer Fl. Trop. Afr. V. 131, Fl. Cap. V. 42. A. gangetica, Lindau in Engl. & Prantl Pflanzenfam. IV. 3 B, 326, fig. 131; Prain Beng. Plants 813.

Penang: Deschamps; Waterfall, King; John Scott. SINGAPORE: Deschamps; T. Anderson; Hullett 67.—DISTRIB. Indian Peninsula; Tropical and South Africa; elsewhere perhaps only a weed of cultivation.

There is no definite line between the examples of this species with small corolla (as John Scott's Penang example, with corolla only '75 in. long and small leaves) and the A. chelonoides, Nees. T. Anderson called our present plant A. gangetica; while he has twice marked the Java A. chelonoides (with subcompound inflorescence) as A. coromandeliana.

2. ASYSTASIA INTRUSA, Blume Bijdr. 796 (1825) (excl. syn.). A slender undershrub, 2 to 5 ft. high, sparingly pubescent. Leaves 2 to 3 in. long, elliptic-lanceolate; base obtriangular. Racemes 1 to 2 in. long; flowers often opposite. Corolla ·7 to ·75 in. long, dull pink; tube linear, widened only near the top. Capsule ·75 in. long; seeds 4, tubercular. Stamens, pollen, pistil, nearly as of A. coromandeliana. Moritsi Verz. Zoll. Pfl. 47; Hassk. Cat. Hort. Bogor. p. 149 (excl. syn.); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 493; Ridley in Journ. As. Soc. Straits 121 (Singapore 1900). A. Blumei, Nees in DC. Prodr. XI. 167; Miq. Fl. Ind. Bat. II. 793; Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 326. Isochoriste javanica, Miq. Fl. Ind. Bat. II. 822; Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 326.

Penang: J. Scott; Deschamps; Curtis 2741; Waterfall, Curtis 1853, 3732. Singapore: Schomburgk 72; Hullett; Ridley 3862.—Distrib. Frequent throughout the Malay Archipelago.

Nees altered the name of this plant, because he says that there existed an earlier Asystasia intrusa of Forskahl; Forskahl's name, however, was Ruellia intrusa.

20. PHIALACANTHUS, Benth.

Calyx-segments united into a tube at the base (very shortly so in P. minor). Inflorescence glabrous or very nearly so; pedicels spreading, with nodding flowers. Capsule, where known (i.e. in P. Wrayi), supported by the hardened elongate calyx-tube; otherwise as Filetia.—Distrib. Species 4, viz. the 3 below, and P. Griffithii, Benth., from East Assam.

1. Phialacanthus Wrayi, C. B. Clarke, n. sp. A branched nearly glabrous shrub, 2 to 3 ft. high. Leaves opposite, equal; lamina 5 by 2 in., narrowed at either end, subentire; tip acuminate; rhaphides obscure; petiole 75 to 1 in. long. Panicles 2 to 4 in. long, terminal,

sometimes reduced to a simple raceme; bracts scarcely ·1 in. long; pedicels 0 to ·2 in. long, in opposite pairs. Calyx in flower ·25 to ·35 in. long; teeth triangular-lanceolate, acute; calyx in fruit hardening, lengthening (up to ·5 in. and upwards). Corolla 1 in. long and upwards, pale primrose (Wray). Stamens 4; filaments glabrous, united in pairs; anthers sub-equal, the two cells ellipsoid-oblong, at equal height, hardly auricled at the base; pollen 80 by 15 μ , with 2 stopples, and 12 strong raised ribs. Capsule more than 1 in. long, oblong-ellipsoid, smooth, 4-seeded in the upper half; retinacula large.

PERAK: Gunong Summit, alt. 6700 ft., Wray 378.

- P. Griffithii, Benth., has pollen exactly as of P. Wrayi, and is closely allied to it, but has a much more open and compound inflorescence.
- 2. Phialacanthus major, C. B. Clarke, n. sp. A nearly glabrous shrub, 6 to 8 ft. high. Leaves opposite, equal; the blade up to 8 by 3 in., narrowed at each end; petiole more than 1 in. long. Panicles 2 to 5 in. long, terminal, sometimes reduced to a simple raceme; flowers opposite; pedicels 175 in. long, spreading; buds drooping. Calyx nearly 35 in. long, divided more than half-way down; teeth lanceolate. Corolla 1.25 in. long, waxy yellowish-white. Stamens nearly as of P. Wrayi, but the pollen only obscurely ribbed longitudinally. Pistil as of P. Wrayi.

Perak: Scortechini 249; alt. 2500 to 4000 ft., King's Collector 8146, 10929.

3. Phialacanthus minor, C. B. Clarke, n. sp. Very like *P. major*, but smaller in every part. *Leaves* smaller, sometimes only 3 by ·7 in. *Calyx* divided nearly to the base, ·2 in. long; segments linear. *Corolla* ·8 in. long.

PERAK: Scortechini.

21. FILETIA, Miq.

Herbs or small shrubs. Leaves opposite, subequal, petioled, entire, with few or no rhaphides. Panicle symmetrically terminal, frequently reduced nearly to a raceme or spike; pedicels largely opposite; bracts small, inconspicuous, except in F. bracteosa. Calyx:175 to:25 in. long, divided nearly to the base into 5 narrow segments. Corolla-tube linear or cylindric, conspicuously 2-lipped; posticous lip erect, subentire; anticous of 3 oblong lobes. Stamens 4, perfect, subsimilar; anthers 2-celled, the cells oblong, muticous, one placed half-way below the other, or nearly at equal height; pollen short-ellipsoid, with 2 stopples, and longitudinally striate. Pistil glabrous, or hairy in the lower half of the style; ovules 2 in each cell; style shortly 2-fid, or with one

branch obsolete. Capsule stalked, with 4 smooth, flat seeds in the clavate upper part (where known).—DISTRIB. Species about 10, being those here described, the type F. costulata from Sumatra, F. africana, Lindau, and several from Borneo.

We have 3 divisions of Filetia:-

Div. 1. EU-FILETIA.—Corolla-tube linear, 6 in. long; palate glabrous. Cells of the anthers quadrate, glabrous. Pollen with longitudinal lines.—Filetia costulata, Miq.

Div. 2. PERAKIA.—Corolla-tube '4 in. long, cylindric; palate (usually densely) furred. Cells of the anthers oblong or narrow-oblong, the upper one fringed with hair. Pollen with longitudinal latticed bands.—Here belong the 4 species below described, and some of Malaya.

Div. 2. Afro-Filetia.—Corolla-tube ·125 to ·175 of an inch long; palate glabrous. Anther-cells roundish, the lower divaricate.—Here belongs *Filetia africana*, Lindau.

Panicle spreading. Sepals small, acute, pubescent .. 1. F. paniculata.

Panicle reduced to a raceme or spike. Sepals glabrous, hardly
acute:--

Bracts ovate, larger than the calyx 2. F. bracteosa. Bracts inconspicuous:—

Flowers subsessile. Leaves elliptic or subovate ... 3. F. Scortechini. Flowers pedicelled. Leaves oblong ... 4. F. Ridleyi.

1. Filetia paniculata, C. B. Clarke, n. sp. Branches (seen) 8 to 12 in. long, glabrate, woody below. Leaves: blade 4.5 by 2 in., elliptic, narrowed at either end, nearly glabrous; nerves 8 to 10 pairs; petioles .25 to .35 in. long. Inflorescence of 3, nearly simple, racemes 2 to 4 in. long; floral leaves at base of inflorescence .5 in. long, linear; flowers mostly in opposite separate pairs, on pedicels .125 in. long; bract at base of pedicel linear, .125 to .175 in. long. Sepals .175 in. long, linear, pubescent, acute. Corolla .7 in. long, yellowish, densely hairy down the throat (Scortechini). Pollen 70 by 40 μ , the longitudinal bands latticed. Style hairy at base; ovary nearly glabrous.

PERAK: Scortechini 604.

Scortechini marked correctly his Filetias as nov. genus next Lepidagathis.

2. FILETIA BRACTEOSA, C. B. Clarke, n. sp. Nearly glabrous. Leaves: blade up to 9 by 3 to 3.5 in., elliptic, narrowed at either end; nerves 12 pairs; petioles up to .7 in. long. Inflorescence a dense nearly simple spike 3 by .7 in.; flowers mostly in opposite pairs, nearly sessile; the bract ovate or nearly round, .2 in. long. Sepals .2 in. long, linear-ligulate, glabrous, hardly acute. Corolla and stamens nearly as of F. paniculata. Style hairy in the lower half. Capsule 1 in. long, with 4 seeds in the upper half (resembling the capsule of Eranthemum).

PERAK: Scortechini (none of the 4 sheets numbered).

3. FILETIA SCORTECHINII, C. B. Clarke, n. sp. A much-branching nearly glabrous undershrub. Leaves: blade in the typical collections of Scortechini 2·5 by 1 in., elliptic, rather oblique; nerves 5 to 6 pairs; petioles 0 to ·2 in. long; in Wray 1505 the leaves are 4·5 by 1·75 in., obovate with cuneate base (see also var. β below). Inflorescence a simple spike 2 to 3 in. long; flowers subsessile, in opposite pairs; bract ·125 to ·175 in. long, oblong. Sepals ·25 in. long, linear-ligulate, glabrous, hardly acute. Corolla ·7 in. long, white or pale yellow, furred in the throat but much less so than in F. paniculata. Stamens and pollen as of F. paniculata. Style slightly hairy at the base.

Perak: Scortechini; alt. 4500 to 4900 ft., Wray 258, 1505.

Var. β evolutior. Branches elongate, with long internodes. Leaves: blade up to 5.5 by 2.25 in.; nerves 8 pairs; petiole up to 5 in. long. Spike elongate, loose; the lower pairs of flowers are far apart.

PERAK: Scortechini 306.

This may differ specifically; the flowers are exactly as of F. Scortechinii type.

4. FILETIA RIDLEYI, C. B. Clarke, n. sp. A much-branched nearly glabrous undershrub. Leaves 3 by ·75 in., oblong, narrowed at each end; margins undulate; petioles ·25 to ·35 in. long. Raceme 2 to 3 in. long, rather loose, with opposite pairs of pedicelled flowers; pedicels ·125 to ·175 in. long; bract oblong, shorter than the calyx. Sepals ·2 in. long, linear-ligulate, subobtuse, glabrous. Corolla ·7 to ·8 in. long, white, shaped as of F. paniculata. Stamens as of F. paniculata; the anthercells rather narrower. Style thinly clothed with long white hairs. Capsule 1 in. long, clavate; the 4 seeds in the broadly obovate top.

PERAK: Ridley 9771.

22. LEPIDAGATHIS, Willd.

Herbs or shrubs. Leaves entire, undulate or crenate. Inflorescence of spikes, or of panicles narrowed almost to spikes, many-flowered; bracts secund, usually longer than the sepals, elliptic or narrow-lanceolate, acute; prophylla smaller than the bracts. Calyx divided nearly to the base into narrow-lanceolate segments, whereof 2 are often larger, 2 are sometimes connate at the base. Corolla-tube cylindric; limb 2-lipped; the 5 segments not very unequal. Stamens 4, subsimilar; anther-cells 2, parallel, oblong, often minutely mucronate at the base, at equal height or one slightly below the other; pollen small, ellipsoid, with longitudinal rows of large patches. Stigma nearly entire. Capsule small, 2- or 4-seeded, conic, hairy at top. Seeds flattened, orbicular, hygroscopically hairy on the margin or nearly glabrate.—Species 60, in the hotter regions of the Old World; 2 in America.

Lindau, in order to get *Lepidagathis* into a Tribe characterized by honeycombed pollen, advances the explanation that in *Lepidagathis* honeycomb bands are indicated by rows of points. I reckon honeycomb-pollen to be globose without longitudinal bands, and I do not esteem the pollen of *Lepidagathis* as honeycomb-pollen.

Flowers ·5 in. long. Spikes rarely up to 3 in. long:—
Leaves 3 to 5 in. long. Spikes ·5 to 1·5 in. long ... 1. L. incurva.
Leaves 6 to 7 in. long. Spikes 2 to 3 in. long ... 2. L. chlorostachya.
Flowers 1 to 1·3 in. long. Spikes 4 to 8 in. long:—
Upper bracts elliptic-lanceolate. Corolla pink-purple, 1 in.
long 3. L. longifolia.
Upper bracts linear. Corolla white, 1·3 in. long ... 4. L. macrantha.

1. Lepidagathis incurva, D. Don Prodr. Fl. Nepal. 119 (1825). Stem subcreet, 1 to 2 ft. high, decumbent, rooting at base. Leaves 3 to 5 in. long, oblong, narrowed at each end, pubescent or nearly glabrate; margin often undulate; petiole 5 in. long. Spikes 5 to 1.5 in. long. oblong, axillary and terminal, erect, sessile, often clustered, ciliate, often softly hairy; bracts secund, nearly 5 in. long, lanceolate, mucronate; prophylla nearly 35 in. long, lanceolate, mucronate. Sepals 5, narrowlanceolate, nearly 35 in. long, unequal. Corolla 25 in. long, white with brown spots on the palate. Anther-cells one slightly below the other, often minutely tailed. Capsule 2 in. long, conic, hairy at top. Seeds 4, flat, slightly hairy on the margin. Kurz in Flora LIII. 363 (1870). L. hyalina, Nees in Wall. Pl. As. Rar. III. 95 (1832), and in DC. Prodr. XI. 252; Miq. Fl. Ind. Bat. II. 815; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 521; Hemsl. in Journ. Linn. Soc. XXVI. 244 (1890); Lindau in Engl. & Prantl Pflanzenfam. IV. 3 B, 313; Prain Beng. Plants 815. L. cephalotes, O. Kuntze Revisio I. 492. dependens, Roxb. Fl. Ind. III. 49. Hypoestes cephalotes, Link Jahrb. III. 48.

Penang: Curtis 2760, 3733; Ridley 2760, 7170, alt. 100 to 200 ft.; King's Collector 1292. Kedah: Ridley 8319.— Distrib. Common throughout India; extending to China and Malaya.

2. Lepidagathis chlorostachya, Nees in DC. Prodr. XI. 256 (1847). Leaves 7 by 2.25 in., elliptic-lanceolate, acuminate, attenuate at the base. Spikes often 2 to 3 in. long, broader than in L. incurva; otherwise as in L. incurva. T. Anders. in Journ. Linn. Soc. IX. 496 (1867); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 519.

Penang: Pulo Poongah, Curtis 2941.—Distrib. Mergui, Griffith (K.D.) 6141.

This is a much larger plant than L. incurva; the bracts are longer and the spikes manifestly broader, but the corolla is hardly longer.

3. Lepidagathis longifolia, Wight Ic. Pl. Ind. Or. t. 1564 (1850).

Shrubby, 3 to 6 ft. high. Leaves up to 9 by 2 in., lanceolate, acuminate at either end, glabrous; petioles ·7 in. long. Panicles narrowed nearly to spikes, 6 to 8 in. long, pubescent; bracts lax, ·75 by ·35 in., elliptic, apiculate. Sepals nearly ·5 in. long, lanceolate, unequal. Corolla "pink-purple" or "dull crimson," 1 in. long; tube at top subcampanulate. Anther-cells at equal height, minutely mucronate at the base; pollen of the genus. Capsule seen only young, promises to be conic, small. T. Anders. in Journ. Linn. Soc. IX. 499 (1867); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 523; Ridley in Trans. Linn. Soc. ser. 2, III. 332 (1893).

Malacca: Griffith (K.D.) 6138; Maingay (K.D.) 1751; Goodenough 1690. Negri Sembilan: Muar, Fox 11283. Pahang: Ridley 2174. Johore: Ridley 11127; Curtis. Perak: Scortechini 2038; Wray 1297; Goenong Panli, King's Collector 229; alt. 300 to 500 ft., King's Collector 3025, 10040. Kota Glanggi and Pulau Tawar: fide Ridley. Selanggi: Curtis 2362. Singga: Hullett 5718.

4. Lepidagathis macrantha, C. B. Clarke, n. sp. *Bracts* lanceolate at top, the upper nearly linear, ·75 by ·125 in. *Corolla* white, very pubescent without, 1·3 in. long; otherwise as *L. longifolia*.

PERAK: alt. 300 ft., Wray 3385.

This may prove a variety only of *L. longifolia*, Wight; among the abundant collections of *L. longifolia* there is no specimen that matches *L. macrantha*.

23. BARLERIA, Linn.

Herbs or undershrubs, sometimes prickly. Leaves opposite or whorled, two of a whorl often reduced to spines. Inflorescence a terminal spike (in the Malay Peninsula plants); bract large; prophylla 2 or 0. Calyx large, of 4 distinct segments, 2 inner segments much the smaller. Corolla with a cylindric tube an inch or more long. Stamens 2, perfect; anther-cells 2, at equal height, muticous; pollen globose, honeycombed. Ovary with 2 to 1 ovules in each cell; stigmas 2, short. Capsule ovoid; seeds 2 to 4, large, shaggy with hygroscopic hairs or nearly glabrate.—Species 120, mostly in Africa and Tropical Asia, a few in America.

Leaves with interpetiolar spines. Corolla yellow ... 1. B. Prionitis.

Spineless. Corolla blue ... 2. B. conspicua.

1. Barleria Prionitis, Linn. Sp. Pl. 636 (1753). Glabrous or nearly so. Stems 1 to 3 ft. high. Leaves 2 to 5 by 3 to 1 in., elliptic, narrowed at both ends, mucronate; interpetiolar spines 25 to 75 in. long. Inflorescence terminal; lower flowers of the spike often a little distant; flower-bract lanceolate, widened at the base;

posticous sepal nearly ·5 in. long, elliptic mucronate; anticous calyx-segment similar to the posticous sepal. Corolla yellow; tube hardly ·5 in. long; posticous lip of 4 connate segments ·7 in. long; anticous lip clawed, shorter. Capsule ·5 to ·7 in. long, 2-seeded. C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 482 (with syn.); Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 314, tt. 105c, 106B, 125E; Dyer Fl. Cap. V. 46 (with syn.); Prain Beng. Plants 811, 812.

Malacca: Griffith; Ridley 2696; Harvey; Derry 271.—Distrib. Africa, India.

This plant (with closely allied species) is abundant in Africa, and probably wild in Western India. In Eastern India it is cultivated, and found near villages. It may not be wild at Malacca.

2. Barleria conspicua, Nees in Wall. Pl. As. Rar. III. 92 (1832). Large, sparingly pubescent, without spines. Leaves 8 by 2 in., oblong, acuminate at either end; petioles 5 in. Spikes 5 by nearly 1 in., loose, nearly continuous; bracteoles present, 7 in. long, linear-oblong, minutely strigose; outer sepals 7 in. long, lanceolate, one bifid at the top, with some yellow hairs. Corolla 1 in. long, blue. Capsule 75 in. long, narrowly oblong, glabrate, 4-seeded. Seeds ultimately nearly glabrate. Nees in DC. Prodr. XI. 226; T. Anders. in Journ. Linn. Soc. IX. 493 (1867); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 489. Justicia conspicua, Wall. Cat. 2460.

PENANG: Wallich.

24. Eranthemum, R. Brown [Linn. partim].

Undershrubs, some very small. Leaves opposite, equal or nearly so, petioled, entire, often undulate or obscurely crenulate, nearly glabrous, usually pubescent at least on the midrib beneath. Panicles narrow, or reduced to apparent spikes, terminal in the species of the Malay Peninsula; bracts linear, inconspicuous, only in E. caudifolium so much as 25 in. long. Calyx 125 to 2 in. long (25 in. long or more in E. caudifolium), divided to the base into linear segments, pubescent, ultimately often glabrate. Corolla showy, white or colorate; tube linear (except in E. breviflos); segments 5, quadrate-elliptic, subequal, spreading, more or less one-sided. Stamens 2; filaments very short; anthers in the mouth of the tube or just exsert, of 2 parallel oblong muticous cells placed at equal height; pollen shortly ellipsoid or subglobose, with 2 stopples and 6 to 10 longitudinal bands, often obscure. Ovary with 2 ovules in each cell; style with 2 subequal minute lobes. Capsule with a linear-cylindric base, and 2 to 4 seeds in the much-widened upper half. Seeds ovoid, flattened, glabrate, corrugate. — DISTRIB.

Species 90 (after Mackaya has been taken out), mainly in South-east Asia and Oceania; a dozen species in Tropical Africa with Madagascar, and a few in Tropical America.

Pistil clothed with brown hairs. Flowers . 75 in. long .. 1. E. hirtipistillum. Pistil with a few patent thin hairs or glabrate:-Corolla-tube ·5 to ·6 in. long:-Spikes 3 to 6 in. long; lower flowers solitary, distant .. 2. E. porphyranthos. Panicles 1.5 in. long, of 6 to 12 small flowers .. 3. E. breviflos. Panicles long, dense; flowers clustered or cymulose:-Sepals ·125 to ·25 in. long; leaf-base attenuate .. 4. E. caudifolium. Sepals scarcely 125 in. long; leaf-base obtuse .. 5. E. selangorense. Corolla-tube 1 to 1.3 in. long :-Panicle often reduced to an apparent spike:-Flowers white:-Panicle of elongate, interrupted spikes .. 6. E. album. .. 8. E. Kingii. Spikes dense. Flowers clustered Flowers coloured :-Flowers solitary, all close in a continuous spike .. 7. E. malaccense. Flowers in whorls, the lower standing apart .. 9. E. acuminatissimum. Panicle with lower branches 175 in. long, carrying small cymes .. 10. E. Teijsmanni.

1. Eranthemum Hirtipistillum, C. B. Clarke, n. sp. Erect, 2 ft. high, pubescent. Leaves up to 8 by 3 in., elliptic-acuminate, base subobtuse, fuscous beneath, pubescent on both surfaces; primary nerves 10 pairs; petiole 1.5 in. Inflorescence of 3 to 1 panicles reduced to spikes, 4 to 9 in. long; flowers in clusters of 1 to 5, opposite, mostly .25 to 1 in. apart; bracts linear, .175 in. long. Sepals .2 in., linear, very pubescent. Corolla pale pink; tube .5 in. long; lobes hardly .3 in. long. Stamens and pollen of the genus; the filaments and anthers slightly hairy. Ovary and style-base clothed with erect brown hairs. Capsule nearly 1 in. long, with 4 seeds in the hairy top, constricted between the pairs of seeds. Seeds of the genus.

Perak: Wray 1399.

2. Eranthemum porphyranthos, C. B. Clarke, n. sp. A sparingly hairy, suberect, simple-stemmed undershrub, 1 to 2 ft. high. Leaves very variable in size; blade sometimes 7 by $2\cdot5$ in., sometimes 2 by $\cdot7$ in., elliptic-lanceolate-acute; base cuneate; margin often undulate, subcrenulate; lower surface nearly glabrous or pubescent on the midrib, often when dry whitened; primary nerves 6 pairs; petioles $\cdot25$ to $\cdot3$ in. long. Inflorescence a linear spike, 3 to 6 in. long (but see var. β); flowers sessile, in opposite pairs, the lower pairs $\cdot25$ to $\cdot35$ in. (and upwards), distant; bracts linear, hardly $\cdot175$ in. long. Sepals $\cdot15$ in. long, linear, minutely pubescent. Corolla purple, or light purple, or "white

tinged carnation" (Scortechini); tube '5 in. long, linear, very slender, the upper '175 in. widened, oblong; lobes elliptic, '35 in. long. Stamens of the genus. Style slightly hairy near the base. Capsule '7 in. long, with 4 seeds in the top, minutely pubescent, constricted between the pairs of seeds; seeds corrugated, subscabrous. E. crenulatum, Nees in DC. Prodr. XI. 453 (a partly). E. malaccense, C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 498 (partly).

Penang: Ridley; Deschamps; Curtis 499. Malacca: Cuming 2357. Perak: Scortechini 114, 543, 564; Larút Perak, alt. 1000 to 1500 ft., King's Collector 3907.

The very slender short tube of the corolla, having an oblong dilatation in the upper third of it, marks this species off from most Eranthemums.

Var. β evolutior, C. B. Clarke. Panicle of numerous elongate spikes, with additional spikes from the leaf-axils; corolla-tube up to 7 in. long. Penang: Waterfall, Curtis 348.

3. Eranthemum breviflos, C. B. Clarke, n. sp. A small, woody, crooked-stemmed, branched, nearly glabrous undershrub, 4 to 8 in. high. Leaves 4 by 1.75 in., elliptic, shortly narrowed at each end; nerves 6 pairs; midrib beneath glabrate in the mature leaf; petioles .25 to .75 in. long. Inflorescence a panicle 1.5 in. long, of 6 to 12 flowers, nearly glabrate, on a peduncle .5 in. long; pedicels 0 to .175 in. long; bracts minute, setaceous. Sepals .125 in. long, linear, when young minutely pubescent. Corolla "grey"; tube .25 in. long, cylindric. Stamens and pollen of Eranthemum, glabrous. Capsule .8 to .9 in. long, linear-oblong; seeds 4, in the upper part, nearly smooth.

Perak: Goping, King's Collector 518.

This plant appears closely allied in habit to *E. album*; the short cylindric corollatube and linear-conic capsule (not suddenly narrowed into a cylindric stalk) with smooth seeds, suggest that it may belong to a different genus.

4. Eranthemum caudifolium, C. B. Clarke, n. sp. A shrub, 4 to 5 ft. high, branched upwards, sparingly pubescent. Leaves: blade 7.5 by 2.5 in., elliptic, acuminate at either end, with a linear caudate tip (in Scortechini n. 447), but in other examples leaves are seen narrower with a shorter tip; nerves 7 to 8 pairs; petioles of the lower leaves often 2 to 2.5 in. long, of the upper only .25 in. Inflorescence a narrow dense panicle 6 by 2 in., with brown pubescence; lateral branches hardly .2 in. long, carrying small dense cymes; bracts .35 in. long, linear, setaceous. Sepals .175 to .25 in. long, linear, caudate. Corolla white (Curtis); tube .5 to .6 in. long, often curved towards the top; segments .2 in. long. Stamens of the genus. Pistil and style

very thinly hairy. Capsule 1 in. long, with 4 seeds in the upper part.

Perak: Scortechini 447, 1531; Curtis 3150, 3341. Dindings: Ridley 3066 bis.

There are abundant collections and a detailed MS. description of this plant by Scortechini. It is easily recognized by the small flowers with a large capsule, sometimes more than an inch long.

5. Eranthemum selangorense, C. B. Clarke, n. sp. A branched shrub, minutely pubescent. Leaves: blade 5 to 6 by 2.5 in., elliptic-acuminate; base obtuse or rounded. Panicle 3 by 1 to 2 in.; lower branches sometimes much developed, 1 in. long, carrying 3 to 6 flowers. Sepals scarcely 175 in. long. Corolla-tube 6 in. long. Otherwise as E. caudifolium.

SELANGOR: Sungu Bula, Goodenough 10547; Kwala Lumpor, Curtis 2367.

6. Eranthemum album, Nees in DC. Prodr. XI. 455 (1847). A nearly glabrate undershrub, 1 to 3 ft. high. Stem usually lignescent, with white bark, to the very base of the inflorescence. Leaves opposite, subequal; blade 5.5 by 2.5 in., shortly acuminate at either end, often whitened underneath; margins often obscurely undulate, crenulate; nerves 7 pairs; petioles 5 to 1 in. long. Inflorescence a panicle of many thin spikes, 4 to 8 in. long (poor examples with one spike occur); flowers mostly solitary, in distant pairs, the lower .25 in. apart or more; bracts linear, 175 in.; pedicels 0 to 175 in. (i.e., the spike is itself a contracted panicle). Sepals 175 in. long, linear, minutely pubescent. Corolla white; tube 1 to 1.3 in. long, linear, exactly the same width to the top. Stamens and pistil glabrous; pollen subglobose, 30 μ in diam., lightly banded longitudinally. Capsule 1 in. long, glabrous or scarcely microscopically puberulous, 4-seeded near the top, slightly contracted between the pairs of seeds. Seeds corrugated. C. B. Clarke in Hook. f. Fl. Br. Ind. IV, 498; Ridley in Journ. As. Soc. Straits 121 (Singapore 1900); Prain Beng. Plants 814. E. diversifolium, Miq. Fl. Ind. Bat. II. 837. E. crenulatum, Nees in DC. Prodr. XI. 453. Var. a (partim), 454; Var. γ angustifolia (partim). Justicia alba, Roxb. Fl. Ind. ed. Carey & Wall. I. 117 (1820); Ic. Ined. 1105 in hb. Kew. J. orbiculata, Wall. Cat. 2489 B.

MALACCA: Griffith. MALAY PENINSULA: Griffith (K.D.) 6175 (partly).—DISTRIB. Chittagong; Pegu; abundant in the Andamans and Nicobars; Malaya.

Nees' type example of his *E. Zollingerianum*, viz. Zollinger 162 in Javâ lectus, is in Kew, but is *not* this. In the large examples the paniele has many long curved spikes,

the secund flowers all turned to the convex side of the spike. The smaller forms (?), i.e. J. orbiculata, Wall., have a single straight spike.

7. ERANTHEMUM MALACCENSE, C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 498 (1884) (tab. et syn. excl.). Innovations pubescent. up to 4 to 5 ft. high, often branching. Leaves: blade 5.5 by 1.25 in., lanceolate or narrow, elliptic-lanceolate, acute at either end; nerves 7 pairs, oblique; petioles 175 to 35 in. long. Flowers subsessile, numerous, close together in a spike nearly continuous to its base, mostly solitary, opposite; spikes 2 to 3 in. long, one or several at the end of each branch; pedicels rarely up to 075 in. long; bracts hardly longer than the pedicels. Sepals about .075 in. long, narrow, pubescent. Corolla of one colour, variously noted as violet, purple, pink, pinkyellow, yellow-green; tube 1.125 in. long, linear to the top. Stamens of the genus. Pistil with few patent thin hairs or subglabrate. Capsule (in a Yunnan plant referred here) 7 in. long, clavate, 4-seeded, very nearly glabrous. Ridley in Trans. Linn. Soc., ser. 2, III. 333 (1893). E. erectum, T. Anders. in Journ. Agri.-Hort. Soc. Ind. new ser. I. 286 (1868). E. crenulatum var. grandiflora, T. Anders. l.c. E. Blumei. T. Anders, l. c. (non Nees). E. crenulatum, Nees in Wall, Pl. As. Rar. III. 107 (in large part), and in DC. Prodr. XI. 523 (in part, not of Lindley). Pseuderanthemum malaccense, Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 330.

PROVINCE WELLESLEY: Curtis 203; Ridley 2231. KEDAH: Langkawi Island, Curtis; Ridley 8335. MALACCA: common, fide Ridley; Griffith (K.D.) 6175; Cuming 2389; Harvey; Goodenough 1713; Holmbury 732; Mt. Ophir, Lobb. Perak: alt. 500 ft., King's Collector 8567, 8626, 8665; Curtis 3327. Pekan: fide Ridley. Johore: Curtis.—Distrib. Siam.

This species, abundant in its area, is characterized by the uniform inflorescence, and is always collected in flower. E. palatiferum, Bot. Mag. t. 5957, of which (in Fl. Br. Ind. IV. 498) I referred one piece to E. malaccense, is undoubtedly all true E. palatiferum, of which it has the characteristic inflorescence; the colour of the flowers varies from pale pink to bluish purple in both species. The name E. erectum, T. Anders., is older than E. malaccense, but was published without one word of description.

8. Eranthemum Kingii, C. B. Clarke, n. sp. Branches elongate, with long internodes. Leaves elliptic, shortly acuminate at the tip, hardly acuminate at the base, paler beneath when dry. Spikes solitary, 2 to 4 in. long, dense; the lower axils with 1 to 3 flowers in each axil. Corolla white; tube 1.125 in. long. Otherwise as E. malaccense, C. B. Clarke.

Johore: Jaffaria, King. SINGAPORE: Hullett 810.

The leaves of this species resemble those of *E. album*, Nees, while the spikes resemble those of *E. malaccense*, but are slightly more pubescent, and the corolla is white.

9. Eranthemum acuminatissimum, Miq. Fl. Ind. Bat. II. 835 (1856). Erect, nearly glabrous. Leaves: blade 8.5 by 2 in., acuminateattenuate at either end; nerves 8 pair, oblique; rhaphides on the upper surface numerous, very short; petioles 1 in. Spikes 1 to 3, 7 to 10 in. long, many-flowered, the lower clusters half-whorled, 5 to 1 in. apart, with 5 to 10 flowers to the whorl; the upper whorls fewer-flowered, coalescent; bracts 2 in. long, lanceolate-linear. Sepals 2 in. long, nearly linear, ultimately nearly glabrous. Corolla white, with one segment purple-spotted; tube 1.25 in. long. Stamens of the genus. Capsule 1.125 in. long, with 4 seeds in the upper part, slightly constricted between the seeds. E. Andersoni, Masters in Gard. Chron. 134, 136 (1869); Bot. Mag. t. 5771; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 499; Ridley in Trans. Linn. Soc., ser. 2, III. 333 (1893), and in Journ. As. Soc. Straits 121 (Singapore 1900). E. elegans, Masters in Gard. Chron. 1234 (1868) (not of R. Brown). E. Blumei, Hassk. Cat. Hort. Bogor. 151; T. Anders. in Journ. Agri. Hort. Soc. Ind. new ser. I. 285 (1868), and in Journ. Linn. Soc. IX. 523 (1867); Kurz in Flora LIII. 363 (1870) (not of Miquel). E. diantherum, Blume Bijdr. 793 (not of Roxb.). E. aspersum, Hook. Bot. Mag. 5711. Pseuderanthemum Andersoni, Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 330.

SINGAPORE: T. Anderson 112. Java: cult. in Hort. Bogor. (Kurz 379). Ridley, l.c., thinks the Singapore collection was probably a garden escape.

The "type" of E. acuminatissimum, Miquel, from Utrecht, proves identical with the E. Andersoni, Masters. It was, perhaps, E. viscidum β acuminatissimum, Hassk. Hort. Bogor. p. 151, but not E. viscidum β Blume. The E. Blumei, Miq. (Fl. Ind. Bat. II. 836) is before me, and very closely allied to E. acuminatissimum, but has (as Miquel says) smaller leaves, smaller bracts, and smaller calyx.

10. Eranthemum Telismanni, T. Anders. in Journ. Agri.-Hort. Soc. Ind. new ser. I. 285 (1868). "A shrubby creeper, 8 to 12 ft. long" (King's Collector). Branches '25 in. in diam., with numerous secondary branches springing at a right angle. Leaves: blade 6 by 2 in., broad-oblong, acuminate; nerves 6 pair; base often rounded or truncate, but on the same branch sometimes cuneate-oblique; petioles '25 to 1'25 in. long. Inflorescence a narrow, many-flowered panicle rarely so much as 6 in. long; the lower branches hardly '175 in. long, carrying small cymes (almost clusters) of flowers. Calyx and corolla (white tinged blue) as of E. acuminatissimum, Miq. E. Blumei, Hort. Buitenzorg vix Miquel. E. crenulatum? var., T. Anders. MS.

Perak: Scortechini 1356; Tapa, alt. 2000 to 3000 ft., Wray 837; King's Collector 2176; Larút, alt. 5000 to 800 ft., King's Collector 5489. Malacca: H.D. 364.

T. Anderson's whole diagnosis of his *E. Teijsmanni* is "a fine species with a straggling habit"; and I have no authentic specimen; the name is disposable. Whether this was the imperfectly known *E. graciliforum*, Nees (Wall. Pl. As. ** Rar. V. 3, 107), from Penang I cannot say; it is not the *E. graciliforum* of Madura (Java) distributed from the Buitenzorg Garden. This species resembles much *E. hirtipistillum* (collected at the same locality), but the corolla-tube is here 1.3 to 1.5 in. long.

25. CLINACANTHUS, Nees.

A rambling shrub. Flowers conspicuous, in small drooping cymes at the ends of the branches; bracts and prophylla small, linear. Sepals 5, equal, linear. Corolla-tube narrow, funnel-shaped; limb 2-lipped. Stamens 2; anthers of 1 cell, oblong, muticous; pollen ellipsoid, with 2 longitudinal bands. Style very shortly 2-fid. Capsule stalked, 4-seeded. Only 1 species.

1. CLINACANTHUS BURMANNI, Nees in DC. Prodr. X. 511 (1847). Stems round. Leaves glabrate; blade 3 by ·5 to ·8 in., elliptic-lanceolate or lanceolate, entire or crenate; base obtuse or attenuate; petiole ·25 in. long. Cymes pubescent, 5- to many-flowered; bracts ·125 in. long. Sepals ·25 in. long, minutely hairy. Corolla orange-red or dull scarlet, 1·25 in. long, lobed one-third to half-way down. Stamens glabrous, no rudiments. Style glabrous. Miq. Fl. Ind. Bat. II. 854; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 524; Lindau in Engl. & Prantl Pflanzenfam. IV. 3 B, 340; Hemsl. in Journ. Linn. Soc. XXVI. 244 (1890). C. nutans, Lindau in Engl. & Prantl Pflanzenfam. IV. 3 B, 340. Justicia nutans, Burm. Fl. Ind. 10, t. 5, fig. 1. J. fulgida, Blume Bijdr. 784. Beleropone? fulgida, Hassk. Cat. Hort. Bogor. 151.

MALACCA: Maingay 1977 (K.D. 1180); Songkah, Curtis 2904.— DISTRIB. Siam, Borneo, Hainan.

26. Justicia, Linn.

Herbs or shrubs. Leaves opposite, subequal or sometimes pseudalternate, entire or undulate. Inflorescence various in the different sections, from strobilate spikes to panicles with the flowers all pedicelled; bracts and prophylla small, linear, sometimes lanceolate, or in the strobilate spikes round, large, imbricate (these large round bracts in many cases cover more than one flower, and are then floral leaves). Calyx small, deeply 5-fid (4-fid in Sect. Rostellaria). Corolla-tube

shorter (or scarcely longer) than the 2-lipped limb; segments imbricated (not twisted) in the bud. Stamens 2; anther-cells 2, one below the other, tailed; pollen ellipsoid, small, longitudinally ribbed beside the stopples. Ovary 4-celled; style shortly bifid. Capsule regularly dehiscent; 4-seeded (the placentæ not springing elastically from the base of the capsule), stalked with the seeds in the top, or seed-bearing nearly from the base. Seeds ovoid, flattened, verrucose, subtubercular, glabrous (except in Sect. Rhaphidospora). — Distrib. Species 150, widely spread throughout the hot regions of the world.

This genus is only artificially separated from several others (as from Leda Adhatoda, Ptyssiglottis) by the white tail to the lower anther-cell. If this character be not regarded as of generic importance, the number of species may be 300, as in the arrangement by Lindau in Engl. & Prantl Pflanzenfam.

Sect. 1. Bracteate. Bracts (floral leaves) round, large, strobilate at least in the young spikes:—

Peduncles short :-

Spikes linear, interrupted

strobilate at least in the young spikes :-Flowers mostly solitary under each bract (floral leaf) :-Corolla glabrous without, except a few hairs at the tip .. 1. J. ptychostoma. Corolla hairy without :-Nerves of the leaves 6 to 7 pairs:-Leaves mostly cuneate at the base .. 2. J. pubiflora. .. 4. J. Scortechinii. Leaves rounded at the base Nerves of the leaves 10 to 11 pairs .. 3. J. patulinervis. Flowers 2 to 3 or more clustered under each bract:-Bracts 5 in. long, including the petiole .. 5. J. subcymosa. Bracts ·6 in. long, subsessile .. 6. J. sclangorensis. Sect. 2. Calophanoides. Flowers axillary, cymose, solitary or clustered; without a terminal cyme or panicle. Corolla small:-Leaves opposite, subequal:-.. 7. J. quadrifaria. Leaves elliptic 8. J. Necsiana. Leaves linear-oblong .. Leaves apparently alternate, i.e. one of each pair 0 or minute, deciduous:-Leaves on the nerves beneath and stem nearly glabrous:-Herb, with long internodes .. 9. J. henicophylla. .. 10. J. subalternans. Much-branched shrub Leaves on the nerves beneath and stem hairy .. 11. J. alternifolia. .. 12. J. otophora. Leaves one of each pair reduced to a persistent ear Sect. 3. Gendarussa. Spikes terminal, and terminal on short axillary branches; bracts mostly narrow, the lowest rarely imbricate:--Leaves narrow-oblong or lanceolate :-Spikes dense; flowers clustered 13. J. Gendarussa. Spikes lax; flowers mostly solitary .. 14. J. Maingayi. Leaves elliptic, large (5 to 8 in. long):-

.. 15. J. vasculosa.

Justiciain conspicua, Dayd.-Jack. Ind. Kew., is a bare name, founded on Wall. Cat. n. 2475. The "type" of this came from Penang; but Wallich sorted with it, doubtfully, one plant from hb. Wight, another from Silhet. I have not found n. 2475.

1. Justicia Ptychostoma, Nees in Wall. Pl. As. Rar. III. 108 (1832). A herb, very sparingly pubescent. Stem 1 to 4 ft. high, branching; internodes 3 to 6 in. long. Leaves 6.5 by 2.25 in., elliptic-lanceolate, acuminate at tip, cuneate at base (but see the Varieties below), often undulate or obscurely crenate on the margin, with very small rhaphides on both surfaces; primary nerves 7 to 9 pairs, oblique; petioles 5 to 15 in. long; opposite pairs of leaves equal or rarely somewhat unequal. Peduncles terminal, penultimate, or axillary, 1 to 2 in. long, frequently 2 from one axil; spike 1 in. long, or lengthening to 1 to 4 in. long; bracts round, ovate, green, 3 to 35 in. long, shortly stalked, very caducous, nearly glabrous, but often with white bristles on the margin; with 1 (rarely 1 to 2) flower under each bract. ·125 in. long, nearly glabrous; segments linear. Corolla lurid whiteyellow marked with purple grey lines; corolla before expansion nearly 5 in. long, glabrous without, or with a few hairs at the very tip. Filaments glabrous; anther-cells round, one lower than the other with a short conic white tail; pollen small, ellipsoid, 30 μ long, with two stopples and two rows of tubercles (or round patches) on each side of the stopple. Pistil glabrous; style very shortly 2-fid. Capsule ·5 in. long, glabrate, 4-seeded. Seeds flattened, verrucose, subtubercled. Anders. in Journ. Linn. Soc. IX. 517 (1867); C. B. Clarke in Hook. f. Fl. Br. Ind. 4 534 (emend.). Rhytiglossa ptychostoma, Nees in DC. Prodr. II. 337. R. ptychosperma, Mig. Fl. Ind. Bat. II. 825.

PERAK: Scortechini 689; Wray 2046; alt. 100 ft., King's Collector 2077. Penang: Porter (Wall. Cat. 2478). Kedah: Curtis 2117.

VAR. β angustifolia, C. B. Clarke. Leaves lanceolate or linear-lanceolate.

PERAK: alt. 5000 ft., Gunong Inas, Wray 4130.

Var. γ rotundifolia, C. B. Clarke. Leaves 6 by 3.5 in., rounded at the base.

Perak: Ridley 7163.

Var. δ auriculata, C. B. Clarke. Leaves narrowly, unequally cordate at base, with two ears.

Perak: alt. 500 ft.; King's Collector 2062; Scortechini.

This is a striking var.; some of Scortechini's examples show on the same stem leaves acute at base and leaves auricled at base.

VAR. ɛ parvibracteata, C.B. Clarke. Spikes interrupted at base; bracts very small, round, long-petioled, spreading, hardly (or not) imbricated.

Perak: Ridley 7166; Goping, King's Collector 555.

Wallich's (one) type sheet of this is very imperfect, as can be inferred from Nees' description, and my account in Hook. f. Fl. Br. Ind. is erroneous both as to the bracts and the synonymy.

2. Justicia publiflora, C. B. Clarke, n. sp. Leaves 4 to 6 in. long, elliptic-lanceolate, cuneate or rounded at the base; nerves 6 pairs; rhaphides none (or most obscure) on either surface. Peduncles terminal, and a few axillary; bracts (floral leaves) round-ovate, green, 35 in. long, shortly stalked, pubescent, without white bristles on the margin. Calyx pubescent. Corolla very hairy without. Style at base slightly hairy. Anther-cells short-ellipsoid, the lower with a medium ovoid tail; pollen ellipsoid; pores 2; one longitudinal row of tubercles on either side of each pore. Otherwise resembling J. ptychostoma, Wall.

PERAK: alt. 4000 ft., King's Collector 3671; Scortechini.

3. Justicia patulinervis, C. B. Clarke, n. sp. Sparingly pubescent. Leaves 6 by 4 in., crenate, truncate at base, very shortly cuneate on the petiole; nerves 10 to 11 pairs, spreading at right angles from the midrib. Spike dense; bracts nearly glabrate, with some white bristles on the margin. Corolla hairy without. Otherwise as J. pubiflora.

PERAK: Scortechini.

4. Justicia Scortechinii, C. B. Clarke, n. sp. Leaves 3 to 4 in. long, ovate or elliptic-acuminate, most of them rounded at the base, crenulate; nerves 6 to 7 pairs, without rhaphides. Spikes dense; bracts round-ovate, imbricate, somewhat pubescent, not bristle-ciliate. Corolla hairy without. Capsule hairy, nearly to the base. Otherwise as J. publiflora.

PERAK: Scortechini 41, 387.

The leaves have dried a rich brown in all the nine sheets of Scortechini, so that they look very unlike the preceding three species.

5. Justicia subcymosa, C. B. Clarke, n. sp. Stem 2 to 5 ft. high. Leaves ovate-acuminate, up to 9 by $5\frac{1}{2}$ in., mostly obtuse at the base; nerves 11 pairs; petioles 1 to 2 in. long. Inflorescence up to 9 by 1 in.; bracts 5 in. long (petiole included), ovate, at first imbricated, in fruit often distant patent; a condensed cyme of 3 to 7 flowers under each floral leaf. Sepals hardly 125 in. long, pubescent. Corolla pale

yellow, 5 in. long, hairy without. Capsule nearly 7 in. long, hairy to the base. Stamens and pistil nearly as of J. ptychostoma.

Penang: Curtis 1765. Perak: Scortechini; alt. 500 to 1000 ft., King's Collector 5766, 10244. Selangor; Ridley 7593.

A larger plant than the four preceding. It has been supposed allied to J. decus sata, Roxb., but the pseudo-spikes do not branch.

6. Justicia selangorensis, C. B. Clarke, n. sp. Leaves 9 by $4\frac{1}{2}$ in elliptic, shortly acuminate, rounded or cuneate at the base, dark purple (Ridley); nerves 9 to 10 pairs, oblique; petioles 2 to 4 in. long. Pedwicles '75 in. long; spikes 4 by 1.25 in., slightly pubescent; bracts ovate or obovate, up to '6 in. long, subsessile, glabrate, imbricate, purple (Ridley), with 2 or 3 flowers under each. Calyx small, glabrate. Corolla white (Ridley). Capsule hardly '35 in. long, glabrate.

SELANGOR: Ridley 7587.

- I have seen no flowers. This may be near the group of J. burmanica and J. Atkinsoni.
- 7. Justicia quadrifaria, Wall. Cat. 2479 (1828-49). Branches 2 to 3 ft. long, little divided, pubescent. Leaves opposite, subequal, somewhat pubescent, at least on the midrib; blade elliptic, 2 to 4 in. long, acuminate at either end, entire; petiole 0 to 35 in. long. Flowers densely clustered in the axils, sometimes in small heads on short axillary peduncles; bracts (rather floral leaves) spathulate, rusty-pubescent, occasionally present. Sepals 25 in. long, linear, pubescent. Corolla 25 to 35 in. long, white with rose spots. Stamens 2; anthercells 2, one below the other, tailed; style glabrous. Capsule 25 in. long, glabrate or minutely pubescent; solid pedicel very short; seeds 4, verrucose-tubercular. T. Anders. in Journ. Linn. Soc. IX. 514 (1867): C. B. Clarke in Hook f. Fl. Br. Ind. IV. 530; Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 349; Hemsl. in Journ. Linn. Soc. XXVI. 246 (1890). J. Zollingeriana, C. B. Clarke, l.c. Gendarussa quadrifaria, Nees in Wall. Pl. As. Rar. III. 105. Adhatoda quadrifaria and Neesiana, Nees in DC. Prodr. XI. 396.

SINGAPORE: Hullett 156. SELANGOR: Curtis.—DISTRIB. Khasia, Tenasserim, Sumatra, China.

8. Justicia Neesiana, T. Anders. in Journ. Linn. Soc. IX. 513 (1867). Leaves oblong or linear-lanceolate, 1·5 by ·25 in. in the type examples, but (in Wray 3538) attaining 4 by ·75 in. Sepals hardly ·175 in. Corolla ·25 in. long. Otherwise as J. quadrifaria, Wall. C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 531. Gendarussa Neesiana, Wall. Cat. 7175; Nees in Wall. Pl. As. Rar. III. 105. Adhatoda Neesiana, Nees in DC. Prodr. XI. 397.

Perak: Scortechini 38, 1304; alt. 300 ft., Wray 3538. Bungal R.: Lobb.—Distrib. Amherst.

Scortechini, n. 38, and Lobb's example agree with the Wallichian Amherst plant. Wray's example is much larger, and from description is not separable from *J. salicifolia*, T. Anders. (see Fl. Br. Ind. IV. 531), a Khasia plant, which, however, it does not match. As stated in the Fl. Br. Ind. IV. 530, *J. Neesiana* should be esteemed only a var. of *J. quadrifaria*.

9. Justicia henicophylla, C. B. Clarke, n. sp. A herb, 1.5 to 4 ft. high, nearly glabrous. Leaves apparently alternate, attaining 9 by 3.5 in., often only half these dimensions, elliptic or ovate, acuminate, acute; base cuneate, not rarely unequal, with one side rounded or almost cordate; primary nerves 7 pairs; petioles 0 to 25 in. long. Inflorescence of axillary peduncled cymes, sometimes small few-flowered, sometimes compound 40-flowered (but less than half the length of the leaf); bracts and prophylla minute. Sepals 5, linear, 175 in. long, pubescent. Corolla a greenish cream-colour, the palate marked with rose-purple, 35 in. in length, pubescent without; altogether as of a Justicia. Stamens 2; filaments glabrous; cells of anthers 2, ellipsoid, one (half its length) below the other with a white tail; pollen ellipsoid, 30 μ long, with 2 stopples, and a longitudinal row of patches on either side of each stopple. Style hairy, shortly 2-fid at top. Capsule ·7 in. long, glabrate; base cylindric, with 4 seeds in the upper (widened) part; seeds glabrous, granular-scabrid.

The numerous examples here collected may include more species than one; some (King's Collector 2189, Curtis 1342) have dried green; others (Wray and Scortechini) have dried red tinged black. The leaves in some are shortly acuminated, in others long acuminated. The base of the leaf varies greatly on one branch.

Perak: Curtis 1342; Wray 1402, 2751; Scortechini; alt. 500 ft., King's Collector 2189, 10297.

Var. β caudata, C. B. Clarke. Leaves very unequal at the base; the tip caudate, curved on one side.

Perak: Goping, alt. 500 to 800 ft., King's Collector 4349.

Var. γ scandens, C. B. Clarke. "A slender creeper, 20 to 25 ft. high." Leaves at the base nearly equal-sided, cuneate.

Perak: Goping, alt. 300 to 500 ft., King's Collector 6058.

10. Justicia subalternans, C. B. Clarke, n. sp. A much-branched shrub, 2 to 4 ft. high, nearly glabrous. *Leaves* opposite, rarely subequal, one of each pair often wanting or less than 125 in. long; nearly sessile, 1-sided, curved, shining, 4 by 1.25 in. long, acuminate, acute, minutely scabrous on the midrib beneath. *Inflorescence* of peduncled, axillary, short cymes. *Sepals* 125 in. long, lanceolate, pube-

scent. Stamens 2; one anther-cell below the other, white-tailed. The flowers and inflorescence much as of J. henicophylla.

PERAK: Kinta, alt. 300 to 800 ft., King's Collector 7061.

11. Justicia alternifolia, C. B. Clarke, n. sp. Shrub, 2 to 3 ft. high, with hairy stem. Leaves all alternate (i. e. one of each pair ·1 in. long, early deciduous); lamina ovate, oblique, acute, 7 by 3·5 in., very unequal at the base; primary nerves 8 to 9 pairs, hairy on the under side of the leaf; petioles ·1 to ·25 in. long. Inflorescence of small, short-peduncled, pubescent, axillary, few-flowered cymes; bracts and prophylla inconspicuous. Capsule ·7 in. long, hairy, cylindric at base, with 4 seeds at the top.

PERAK: alt. 500 to 700 ft., King's Collector 10680.

The corolla has not been seen. This can hardly be a species of *Hallieracantha*, as the cyme is too open and the calyx too small for that genus.

12. Justicia otophora, C. B. Clarke, n. sp. Nearly glabrous. Branches slender, round, zigzag. Leaves sessile, one of each pair reduced to an ovate persistent ear 25 to 35 in. long; the other 4.5 by 1.35 in., elliptic; base unequal, rounded on one side; tip caudateligulate. Peduncles 5 to 1 in. long, axillary, carrying small fewflowered cymes. Sepals 175 in. long, linear-lanceolate, nearly glabrous. Capsule 7 in. long, glabrate, cylindric at the base, with 4 seeds in the top.

PERAK: Scortechini.

The anther-tails have not been seen; it is inferred from the small calyx and the peduncled cymes that the genus is *Justicia* (alternate-leaved section), and not *Hallieracantha*.

13. Justicia Gendarussa, Linn. f. Suppl. 85 (1781). Erect, 2 to 4 ft. high. Leaves 4 by '75 in., lanceolate, glabrous, entire or undulate; petioles '25 in. long. Spikes (condensed panicles) 2 to 5 by '75 in., terminal, sometimes panicled; flowers clustered; floral leaves 0; bracts '125 to '175 in., linear. Sepals 5, linear, viscous-pubescent, '175 in. long. Corolla '5 in. long, white or rose-purple, pubescent without or nearly glabrous. Stamens 2; one anther-cell a little below the other, tailed; pollen 30 μ long, ellipsoid, with 2 longitudinal rows of patches beside each stopple. Capsule '5 in. long, clavate, glabrous, 4-seeded. Blume Bijdr. 785; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 532; Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 347, t. 189, fig. D; Hemsl. in Journ. Linn. Soc. XXVI. 245 (1890); Ridley in Trans. Linn. Soc. ser. 2, Bot. III. 333 (1893), and in Journ. As. Soc. Straits, 122 (Singapore 1900); Prain Beng. Plants, 817, 818. Gendarussa vulgaris,

Nees in Wall. Pl. As. Rar. III. 104; Wight Ic. t. 468; Moritsi Verz. Zoll. Pl. 47; Hassk. Cat. Hort. Bogor. 151; Miq. Fl. Ind. Bat. II. 831.

Penang: King's Collector 1461; Deschamps; Curtis 791. Malacca: Griffith. Perak: alt. 500 ft., King's Collector 8682. Dindings: Pangkore, Scortechini 208, 950.—Distrib. South-east Asia; largely cultivated.

The Malay Peninsula material may be all from cultivated plants; none shows a capsule. Ridley, *l. c.*, observes that it seems never to fruit, and that he knows it only from gardens or remains of cultivation.

14. Justicia Maingayi, C.B. Clarke in Hook. f. Fl. Br. Ind. IV. 534 (1885). A small shrub, with weak branched stems 2 ft. long. Leaves 4 by 35 to 1.25 in., nearly glabrous, entire or undulate-crenate; tip acuminate; base cuneate; upper surface with rhaphides; petiole 2 in. Spikes terminal and axillary, 2 to 3 in. long, linear, peduncled, often 2 to 3 panicled on one peduncle; flowers mostly solitary, distant; bracts and prophylla minute. Sepals:175 in. long, lanceolate-linear, pubescent. Corolla:5 in. long, pubescent without, nearly as of J. vasculosa. Stamens 2; filaments glabrous; anther-cells 2, ellipsoid, one below the other with a white tail. Pollen oblong-ellipsoid. Capsule:35 in. long, 4-seeded at the top.

PENANG: Maingay (K.D.) 1181.

15. JUSTICIA VASCULOSA, Wall. Cat. 2469 (1826). Branches 8 to 20 in. long, dividing, rather weak. Leaves ovate to narrow-elliptic, attenuate at either end, up to 5 by 2 in., nearly glabrous; petiole 5 in. long. Spikes 2 to 4 in. long, linear or oblong, terminal and axillary, often clustered or subpaniculate; flowers distant, opposite, sessile, solitary or sometimes clustered; floral leaves often 0, sometimes several, narrow-lanceolate, 5 in. long, green, scattered about the lower portion of the spike; bracts and prophylla very small, pubescent. Sepals ·175 in. long, linear-lanceolate, pubescent. Corolla ·5 in. long, yellow; the mouth pink-spotted; upper lip oblong entire, lower pendent. Stamens 2; filaments glabrous; anther-cells 2, round-ellipsoid, one below the other, with a white knob at the base; pollen 40 μ long, ellipsoid, with 2 stopples and longitudinal rows of tubercles beside them. Pistil glabrous, except a few hairs near the base of the style. Capsule ·6 in. long, with 4 seeds in the upper part, glabrate. T. Anders. in Journ. Linn. Soc. IX. 515 (1867); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 533. Ruellia rivinæfolia, Wall. Cat. 2413. Gendarussa vasculosa, Nees in Wall. Pl. As. Rar. III. 104. Adhatoda vasculosa, Nees in DC. Prodr. XI. 407.

Penang: Curtis. Pahang: Ridley 2183. Singapore: Ridley 3165.—Distrib. Eastern India, plentiful, from Assam to Tenasserim; Sumatra.

16. Justicia uber, C. B. Clarke, n. sp. Stem 3 to 4 ft. high. Leaves opposite, subequal; blade up to 10 by 3 to 4 in., elliptic or subovate, lanceolate acuminate at tip, cuneate at base; margin undulate; upper surface glabrate, lower paler, obscurely pubescent; rhaphides none or obscure; nerves 8 pairs, oblique; upper petioles 5 in. long. Spikes terminal and on axillary peduncles, sometimes panicled, dense, nearly always 1-sided, 1 to 3 by 5 in.; bract and prophylla 175 in. long, narrow-lanceolate, nearly glabrate. Sepals 175 in. long, narrow-lanceolate, nearly glabrate. Sepals 175 in. long, somewhat hairy without. Stamens 2; one anther-cell much below the other, with a white tail. Capsule 6 in. long, stalked, 4-seeded, glabrate. Seeds flattened, verrucose, tubercled.

Perak: Scortechini 96, 319; alt. 400 to 700 ft., Wray 386; King's Collector 10245; Ridley 9773. Selangor: Ridley 8216.

This plant flowers and fruits freely; and there is more of it in the collections than of any other Acanth of the Malay Peninsula.

17. Justicia sumatrana, C. B. Clarke. Nearly glabrous; the inflorescence minutely pubescent. Leaves opposite, subequal; blade 6 by 3 in., broadly elliptic, entire; tip very shortly acuminate; base cuneate; nerves 7 to 8 pairs; petiole 35 in. long. Peduncles near the ends of the branches, 4 to 6 in. long, each carrying a very lax panicle of thin linear spikes 2 to 4 in. long; floral leaves 0; flowers solitary, minutely pedicelled, opposite; bract and prophylla minute. Sepals 175 in. long, lanceolate linear, viscous-scabrous. Corolla greenish-white with purple spots, 4 in. long, minutely pubescent without. Stamens 2; flaments glabrous; anther-cells ellipsoid, one below the other, with a short conic white tail; pollen 25 by 15 μ , with longitudinal series of spots. Pistil glabrate, except the base of the style. Capsule 6 in. long, nearly glabrous, 4-seeded in the upper part; seeds cerebrose-tubercular. Gendarussa? sumatrana, Miq. Fl. Ind. Bat. II. 832.

Perak: Scortechini 340; Wray 1596.—Distrib. Sumatra (Teijsmann).

This species is allied to J. flaccida, Kurz, but the petioles are not eared at base; the flowers are much smaller.

18. Justicia procumbens, Linn. Sp. Pl. 15 (1753). Annual, much branched, decumbent or procumbent. *Branches* slender, quadrangular. *Leaves* elliptic or oblong, 1 to 2 in. long, glabrous or hairy, short-

petioled. Spikes cylindric, continuous, hirsute; bracts linear-lanceolate, ·175 in. long. Sepals 4, linear, ·175 in. long, hirsute. Corolla ·25 to ·35 in. long, white pink-spotted. Stamens 2; anthers 2-celled; one cell below the other, tailed. Capsule ·25 in. long, 4-seeded nearly from the base. Benth. Fl. Austral. IV. 549; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 532; Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 349; Hemsl. in Journ. Linn. Soc. XXVI. 246 (1890). J. diffusa, Prain Beng. Plants 818. Rostellaria procumbens, Nees in Wall. Pl. As. Rar. III. 101. Rostellularia procumbens, Nees in DC. Prodr. XI. 371; Moritsi Verz. Zoll. Pfl. 47; Miq. Fl. Ind. Bat. II. 826.

Penang: Curtis 3099.—Distrib. South India; Australia.

The group to which J. procumbens belongs may be esteemed to form but one species; in which case its area would include all South and East Asia.

27. ADHATODA, Nees.

Spikes strobilate; the large bracts imbricated, green. Stamens 2; anther-cells 2, oblong, at nearly equal height, at the base subacute or with a minute knob, not tailed. Otherwise as Justicia.—DISTRIB. Species, the present common one; with which 6 or 8 other plants from Tropical Africa have been generically associated.

This plant resembles altogether the bracteate section of *Justicia* with strobilate spikes, except that the anther-cells have not at their base the characteristic white anther-tail.

1. Adhatoda vasica, Nees in Wall. Pl. As. Rar. III. 103 (1832). A dense shrub, 3 to 8 ft. high. Leaves 8 by 3 in., elliptic, acute at either end, entire, minutely pubescent; petioles 1 in. long. Peduncles 1 to 6 in. long, from the upper axils of the branches. Spikes strobilate, 2 to 6 in. long; bracts ovate, green, entire, ·75 by ·25 in.; prophylla up to ·5 by ·125 in. Sepals ·3 to ·35 in. long, lanceolate. Corolla white, purple-spotted, 1·25 in. in total length; tube short, widened above the base. Capsule ·75 in. long, stout, clavate, pubescent, with 4 rough seeds at the top. C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 540 (with syn.); Prain Beng. Plants 819. Justicia Adhatoda, Linn. Sp. Pl. ed. i. 15, ed. ii. 20; Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 349; Hemsl. in Journ. Linn. Soc. XXVI. 244 (1890); Ridley in Journ. As. Soc. Straits 122 (Singapore 1900). Gendarussa Adhatoda, Hassk. Cat. Hort. Bog. 151.

Penang: Curtis 1017. SINGAPORE: fide Hook. f. Fl. Br. Ind. IV. 540.—DISTRIB. Throughout India, extending to Malaya; commonly cultivated.

28. RHINACANTHUS, Nees.

Erect or rambling herbs. Leaves entire; margins often undulate. Flowers in subsessile distant clusters on the branches of the panicle; bract and prophylla very small, linear. Sepals 5, linear, very small, hairy. Corolla 2-lipped; tube linear, longer than the lips; anticous lip patent, deeply 3-lobed; posticous lip narrowly oblong-linear, emarginate, curved and curled. Stamens 2; shortly exserted; anther-cells 2, one somewhat below the other, not tailed; pollen ellipsoid, longitudinally banded. Ovary hairy; ovules 2 in each cell; stigma shortly subequally 2-lobed. Capsule with cylindric stalk, and 4 seeds in the top; placentæ not rising elastically. Seeds orbicular, flattened, black, pubescent.—Distrib. Species 3 or 4, in the warm parts of Africa and India.

1. Rhinacanthus communis, Nees in Wall. Pl. As. Rar. III. 109 (1832). Hairy or nearly glabrous, 2 to 4 ft. high. Leaves opposite, subequal, ovate to lanceolate, subobtuse, entire, 2 to 5 in. long, narrowed to a petiole 0 to 35 in. long. Panicle large, much-branched, with small clusters of flowers on peduncles, sometimes very leafy, sometimes with few small floral leaves; bracts 125 to 25 in. long. Calyx 125 to 25 in. long. Calyx 125 to 25 in. long. Calyx 125 to 109. Usually recognized by the curled linear-oblong lip of the corolla. Hassk. Cat. Hort. Bogor. 151; Moritsi Verz. Zoll. Pfl. 48; Miq. Fl. Ind. Bat. II. 833; C. B. Clarke in Dyer Fl. Trop. Afr. V. 224 (with syn.); Prain Beng. Plants 819. R. Nasuta, Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 339, t. 135, fig. E.

Penang: Deschamps; Curtis 2918. Tongkah: Curtis 2964. MALACCA: Griffith.—DISTRIB. Common in the warm parts of Africa and South-east Asia.

29. Leda, C. B. Clarke [Leptostachya, Nees, partim].

Herbs. Panicle loose; branches long, linear, with distant flowers solitary or in clusters in the typical form; bracts inconspicuous. Stamens 2; anther-cells 2, the lower without a tail, at equal height parallel, or one lower somewhat divaricate; pollen ellipsoid, with 2 stopples, the longitudinal rows of patches on either side of each stopple prominent or obsolete. Otherwise as Justicia, Sect. Gendarussa.—Distrib. Species 12, in South-east Asia.

The seventy American species, among which stands Dianthera, Linn., differ greatly in habit among themselves and from the Indian. The genus Dianthera is sunk in Justicia by Lindau in Engl. & Prantl Pflanzenfam. IV. 3 B, 346, which then has three hundred species and is inconveniently large. But the Indian Dianthera only differs from Justicia vasculosa, Wallich, and its neighbours by the absence of a white tail to the lower anther-cell.

Panicle very open, with long linear branches:-Leaves rounded or sometimes cordate at base...

Leaves obovate, attenuate at base... Panicle almost dense, oblong, hardly 1 in. broad Panicle reduced to two or three flowers

Terminal spikes simple; flowers solitary

.. 1. L. subcordata.

.. 2. L. obovata.

.. 3. L. densiflora.

.. 4. L. radicans.

.. 5. L. andrographioides.

1. Leda subcordata, C. B. Clarke, n. sp. Nearly glabrous; the innovations and inflorescence minutely pubescent. Stem 1 to 2 ft. long, divided, rambling, sometimes decumbent and rooting at the lower nodes (then with smaller leaves). Leaves opposite, subequal; blade 3.5 by 1.5 in., elliptic, acuminate, entire; base rounded or slightly cordate; petioles 1 in. long. Panicles terminal on the slender branches, and with few distant subsolitary flowers; bracts and prophylla minute. Sepals 125 in. long, linear. Corolla white, 5 in. long; tube straight, narrowly funnel-shaped. Stamens 2; anther-cells 2, parallel, at equal height, rounded at base; pollen 45 by 30 \mu, with 2 stopples and 2 longitudinal bands on either side each stopple. Style glabrate.

Perak: King's Collector 970; Scortechini 95; Curtis 3153.

This species is close to the Khasia L. debilis, C. B. Clarke sub Diantherâ, in which the flowers are in approximate, sessile, opposite pairs, forming long linear spikes.

2. Leda obovata, C. B. Clarke, n. sp. Nearly glabrous; the inflorescence minutely pubescent. Stem 1 foot or more. opposite, subequal; blade 5.5 by 2.25 in. obovate, with a very short acumination, entire, with many rhaphides, long decurrent at base; petiole hardly 5 in. long. Panicle terminal, long-peduncled, with few long linear branches; bracts and prophylla minute; the branches very narrow thinly flowered racemes; pedicels .06 in. long, or occasionally 2 to 3 flowers clustered. Sepals 125 in. long, linear, acute. Corolla ("yellow" in Ridley's example) 5 in. long; tube straight, narrowly funnel-shaped. Stamens 2; anther-cells 2, parallel, one placed at one-third of its length below the other, rounded at base; pollen ellipsoid with longitudinal bands. Capsule (young) 7 in. long, with a linear stalk, pubescent.

Perak: Scortechini (type of species). Selangor: Ridley 7592 (an imperfect specimen; appears to match).

This species is near Dianthera leptostachya, Benth.

3. Leda (?) densiflora, C. B. Clarke, n. sp. Glabrous. Stems 8 in. long, decumbent at base. Leaves opposite, equal, some 5 by 1 in., lanceolate, some 5 by 1.5 in, elliptic-lanceolate; nerves 7 to 8 pair, patent; rhaphides many, small on both surfaces; margin undulate; base cuneate to a petiole 25 in. long. Inflorescence terminal; peduncle 5 in. long;

panicle 2 by 1 in., many-flowered; pedicels 0 to ·1 in. long; bracts and prophylla minute or 0. Sepals ·06 in. long, lanceolate, glabrous. Corolla ·5 in. long, yellow, straight, funnel-shaped, deeply 2-lipped. Stamens 2; filaments long, glabrous; anther-cells 2, oblong, parallel at equal height, obtuse at base, microscopically hairy; pollen ellipsoid, with 2 pores and 2 longitudinal lines of patches beside each stopple. Capsule ·75 in. long, slender, glabrous, with 4 seeds in the upper half.

Perak: Ridley 7165.

This plant satisfies the technical characters of Leda, but the habit and inflorescence are those of Eranthemum.

4. Leda radicans, C. B. Clarke, n. sp. Creeping, rooting. Stems 10 in. long, divided, minutely pubescent. Leaves opposite, equal; blade ovate, 1.5 in. long, subentire, with many small rhaphides, rhomboid or nearly rounded at the base; petioles .25 to .5 in. long. Inflorescence terminal, depauperated, of 2 to 3 distant flowers. Sepals .125 to .175 in. long, linear, somewhat pubescent. Corolla nearly .5 in. long, as of Dianthera. Stamens 2; filaments glabrous; anther-cells 2, nearly at equal height, muticous; pollen short-ellipsoid, 25 μ long, with 2 stopples, obscurely marked longitudinally. Pistil glabrous.

PERAK: Ulu Salami, Scortechini 129.

The material for this plant is scanty, and the genus doubtful.

5. Leda andrographioides, C. B. Clarke. Nearly glabrous. Stems about 1 ft. high, weak. Leaves 3 in. long, elliptic, acuminate; petioles 25 to 5 in. long. Spikes 2 to 3 in. long, terminal, solitary; flowers solitary, opposite, in distant pairs; bracts inconspicuous. Sepals 125 in. long, linear-lanceolate, nearly glabrous. Corolla 5 in. long or rather more; tube cylindric, straight; lips short. One anther-cell below the other, with a minute callus at the base; hardly tailed. Justicia andrographioides, C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 534; Ridley in Journ. As. Soc. Straits 121 (Singapore 1900).

SINGAPORE; fide Ridley.—DISTRIB. Tenasserim.

30. POLYTREMA, C. B. Clarke, n. gen.

Slender undershrubs. Opposite pairs of leaves equal or unequal. Inflorescence in small, few-flowered, axillary cymes; bracts inconspicuous. Calyx-lobes 5, linear. Corolla small, 2-lipped. Stamens 2; anther-cells 2, oblong, standing a little apart, one slightly below the other, having its base muticous or sometimes acute, not tailed. Pollen globose or obscurely trigonous-globose, without (or with very obscure) longitudinal bands, surface smooth or most minutely uniformly granu-

lar; stopples 4 in the typical species, possibly 4 to 3 in other species. *Capsule* stalked, with 4 seeds.—Distrib. Species: the 3 here described and 1 in the Philippines.

A group of species resembling in habit some of the Malay plants referred to Ptysiglottis by Hallier f. in Nova Acta Leop. Carol. Akad. 70 (1897) (as P. lanceolata, Hallier f. l.c. 221, t. 15, fig. 1, or P. frutescens, Hallier f. l.c. 222, t. 16, fig. 2), which have ellipsoid pollen longitudinally banded and anther-cells approximated. The type Ptysiglottis from Ceylon is remote in habit and has approximated anther-cells.

Leaves of opposite pairs (many of them) very unequal:-

1. Polytrema vulgare, C. B. Clarke, n. sp. Nearly glabrous; branches round, somewhat zigzag. Leaves opposite, one reduced to an ovate auricle '25 to '5 in. long, the other elliptic or broadly elliptic, 4 to 6 in. long, entire, covered with small rhaphides; tip acuminate; base rhomboid not rounded; primary nerves 10 to 11 pair; petiole 0 to '175 in. long. Cymes few-flowered, small, sessile or very nearly so in the axils; bracts and prophylla hardly any. Sepals '35 in. long, setaceous, minutely pubescent or nearly glabrous. Corolla '7 in. long; tube inflated in the upper half. Stamens 2; anther-cells 2, muticous, distant, one rather the lower. Style glabrous. Capsule '7 in. long, glabrate, with 4 seeds in the upper part.

PERAK: Ridley 7164, 9445, 9768; Wray 3591 (partly); Goping, King's Collector 486. Selangor: Ridley 8545.

2. POLYTREMA CRENULATUM, C. B. Clarke, n. sp. Branches 6 to 8 in. long, decumbent, much divided. Leaves up to 2.5 by 1 in., subsessile, elliptic-acuminate; margin finely crenulate. Cymes closely axillary, 1- to 3-flowered. Sepals 2 in. long, linear-setaceous, nearly glabrous. Corolla 35 in. long. Otherwise as P. vulgare.

Perak: Scortechini (two collections without number).

This is possibly only a starved form of P. vulgare, but it is considerably smaller in every part.

3. POLYTREMA ISOPHYLLUM, C. B. Clarke, n. sp. Herb, 1 to 2 ft. high, nearly glabrous. Leaves opposite, equal, yellow when dry; blade 4·5 by 1·75 in., elliptic-acuminate; base cuneate, entire, covered with rhaphides; primary nerves 7 to 8 pair; petioles ·5 to 1 in. long. Cymes small, few-flowered, closely axillary. Sepals ·35 in. long, setaceous, minutely pubescent. Corolla white, more than ·5 in. long. Stamens 2; filaments glabrous; anther-cells rather long, not tailed,

distant but nearly parallel, one (for one-third its length) below the other. Pistil glabrous.

PERAK: Scortechini 224.

31. Ecbolium, Kurz.

Spikes strobilate; bracts imbricate, enclosing the calyx. Corollatube linear. Stamens 2, without rudiments; anther-cells 2, narrowly oblong, at equal height, muticous; pollen globose, with meridional bands. Capsule stalked, with 4 large flat seeds in the round head. Otherwise as Justicia.—DISTRIB. Species 12 in the warm parts of Africa, Madagascar, Arabia, and India.

This genus resembles the section Bracteatæ of Justicia, which has similar strobilate spikes; it differs in having the anther-cells at equal height and without tails. It is difficult to say by what character it differs from some of the American species of Dianthera; but the Malay Diantheræ (Leda) have all very small bracts.

1. Ecbolium Linneanum, Kurz in Journ. As. Soc. Beng. XL. ii. 75 (1871). A small shrub, glabrate; the inflorescence somewhat pubescent. Leaves opposite, equal, elliptic or obovate, acute, 3 to 6 in. long; base cuneate; petiole ·5 to 1·5 in. Spikes strobilate, 2 to 6 in. long, terminal and on axillary peduncles; bracts ovate, ·5 in. long, green, varying in their margin, which is sometimes serrate, sometimes quite entire, rounded at the tip; prophylla 2, minute. Sepals ·2 in. long, narrow. Corolla green-blue; tube ·75 to 1 in. long, linear to the top; lips ·35 to ·5 in. long. Capsule ·75 in. long; stalk narrowly cylindric; head round, flat, ·3 in. in diam., containing 2 large, round, thin, rough seeds. Boiss. Fl. Orient. IV. 526; Lindau in Engl. & Prantl Pflanzenfam. IV. 3 B, 338; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 544, and in Dyer Fl. Trop. Afr. V. 236 (with syn.); Prain Beng. Plants 816.

Penang: King's Collector 1671. Malacca: Maingay (K.D.) 1172. SINGAPORE: Deschamps. — DISTRIB. Common in warm Africa and India; not yet known from the Malay Archipelago.

Recognized by its green-blue corolla, or by the broad head to the capsule.

32. Graptophyllum, Nees.

Glabrous shrubs. Leaves equal, opposite, entire. Panicles terminal, dense, oblong; bracts and prophylla very small. Corolla large, red; tube narrowly funnel-shaped, curved; otherwise nearly as Ecbolium.—Distrib. Species 3, whereof 1 is widely spread in the warm regions of the Old World, and 2 in Australia.

The red corolla has a much broader tube than that of Ecbolium. The much-cultivated species here described is not confounded with Ecbolium, but is marked

sometimes Justicia, from which it differs by the anther-cells at equal height, not tailed.

1. Graptophyllum hortense, Nees in Wall. Pl. As. Rar. III. 102 (1832). Attains 6 to 8 ft. in height. Leaves broadly elliptic, 5 to 9 in. long, cuneate at either end; petiole hardly 25 in. Panicle narrowed nearly to a raceme, terminal, subsessile, 10- to 40-flowered; bracts and prophylla inconspicuous. Sepals 175 in. long. Corolla red; tube 75 in. long; lips 5 in. long. Hassk. Cat. Hort. Bogor. 150; Moritzi Verz. Zoll. Pfl. 47; Miq. Fl. Ind. Bat. II. 824; C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 545, and in Dyer Fl. Trop. Afr. V. 241 (with syn.). G. pictum, Griff. Notul. IV. 139; Lindau in Engl. & Prantl Pflanzenfam. IV. 3 B, 327.

Perak: Scortechini 1545. Kedah: King's Collector 1765. Wild probably in the Malay Archipelago, where it is plentiful. Frequent in India, also in Guinea, where it is almost certainly introduced.

33. Peristrophe, Nees.

Erect branched herbs. Leaves opposite, subequal, petioled. Flowers 1 to 4 together, and of these one or more often imperfect, clustered between 2 floral leaves; the flower-clusters often peduncled, axillary or terminal; bract and prophylla to each flower small or 0. Calyx small, deeply lobed into 5 subequal lanceolate teeth. Corolla rose or purple; tube slender; limb 2-lipped; upper lip subentire, lower subequally 3-lobed. Stamens 2; filaments pubescent below; anther-cells 2, muticous, narrow, curved, one half its length above the other; pollen short-ellipsoid, longitudinally banded. Ovary 4-ovulate; style filiform, minutely bifid. Capsule ellipsoid, stalked, minutely pubescent; placentæ not rising elastically from the base; seeds granular, subtubercular.—Distrib. Species 25, but several very close together, extending from Africa to Japan and New Caledonia.

Floral leaves ovate triangular, ·5 in. broad; corolla ·25 in. long 1. P. tinctoria.

Floral leaves broadly lanceolate, ·175 in. broad; corolla ·75 in. long 3. P. salicifolia.

Floral leaves linear-ligulate, ·06 to ·09 in. broad; corolla ·75 to 1 in. long 2. P. acuminata.

These three species are very closely allied, as are all species admitted of this group by Nees and Miquel. *P. montana*, Nees, *P. angustifolia*, Nees, *P. salicifolia*, Blume, *P. commutata*, Nees, are not improbably natives of the Malay Peninsula, but are included between *P. tinctoria* and *P. acuminata*.

1. Peristrophe tinctoria, Nees in Wall. Pl. As. Rar. III. 113 (1832). Often 3 to 4 ft. high. Leaves 3.5 by 1.75 in., cuneate at either end, entire, sparingly pubescent; petioles .25 to 1 in. long. Peduncles

·25 to 1 in. long, several often approximated, subpanicled, often glabrate. Floral leaves ovate-triangular, large, up to 1 by ·5 in.; margins not ciliate, but (more or less) minutely scabrid. Calyx ·175 to ·2 in. long, grey, hairy; teeth lanceolate. Corolla 1·25 in. long. Anthers ·175 in. long. Capsule ·6 in. long. C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 556; Hemsl. in Journ. Linn. Soc. XXVI. 248 (1890); Prain Beng. Plants 820. P. pallida, Nees in DC. Prodr. XI. 494; Miq. Fl. Ind. Bat. II. 846; Ridley in Trans. Linn. Soc. ser. 2, III. 334 (1893).

JOHORE: Ridley. KRIAN: Scortechini 1373. SINGAPORE: Scortechini 370, 816.—DISTRIB. Cultivated much in South-east Asia.

P. fera, C.B. Clarke in Hook. f. Fl. Br. Ind. IV. 556, is possibly the wild form of P. tinctoria, and hardly differs from it but by having the floral leaves ciliate on the margins. This plant is (partly) described as P. tinctoria by Nees and Miquel; I have seen no example of it from the Malay Peninsula.

2. Peristrophe acuminata, Nees in Wall. Pl. As. Rar. III. 113 (1832). Smaller than *P. tinctoria*, Nees, in all its parts. Floral leaves ·5 by ·06 to ·09 in. broad, glabrous. Corolla ·75 to 1 in. long. Capsule ·5 in. long. Nees in DC. Prodr. XI. 496; T. Anders. in Journ. Linn. Soc. IX. 521 (1867); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 555; Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 331; Ridley in Trans. Linn. Soc. ser. 2, III. 334 (1893), and in Journ. As. Soc. Straits 122 (Singapore 1900). *P. Blumeana*, Hassk. Cat. Hort. Bogor. 152; Nees in DC. Prodr. XI. 495; Miq. Fl. Ind. Bat. II. 848. Justicia Roxburghiana, Blume Bijdr. 786, fide Miquel.

Penang: Deschamps, Curtis 681. Pahang: Ridley 1165. Perak: Scortechini 14, 146; King's Collector 285. Malacca: Griffith; Harvey; Curtis 254; Goodenough. Singapore: Hullett 93. Pekan: fide Ridley.—Distrib. Eastern India, Burma, Java.

3. Peristrophe salicifolia, Miq. Fl. Ind. Bat. II. 847 (1856). Leaves oblong-lanceolate, often 3 by 5 in., rarely elliptic-lanceolate, often long acuminate. Floral leaves 6 by 175 in. (or broader). Corolla ·75 in. long. Capsule ·5 in. long. Justicia salicifolia, Blume Bijdr. 787. Hypoestes salicifolia, O. Kuntze Revisio I. 491 (1891).

Penang: Deschamps; King's Collector; Ridley 9375. Perak: Scortechini; Wray 847.—Distrib. Java.

This species is separated here from *P. acuminata* by the sole character of broader bracts, and I doubt its specific distinctness. It is a curious coincidence that O. Kuntze should have named his plant (which is at Kew) salicifolia, as he did not intend it to be = Blume's Justicia salicifolia.

34. Hypoestes, R. Brown.

Erect branched herbs or shrubs. Leaves opposite, subequal, petioled. Flowers paired, one of these often imperfect or wanting the two bracts connate (in the Malay species) into an obconic or cylindric involucre; prophylla to the lower bract inside the involucre usually longer than the calyx; prophylla to the upper bract often 0; involucres often numerous, in heads, dense panicles or racemes. Calyx shorter than the involucre, deeply lobed; teeth 5, lanceolate. Corolla rose-purple; tube linear; lips 2, narrow. Stamens 2; anthers of 1 cell, muticous; pollen ellipsoid, longitudinally striate. Ovary 4-ovulate; style glabrate upwards, shortly bifid. Capsule oblong or ellipsoid, stalked, 4-seeded; placentæ not rising elastically from the base of the capsule; seeds glabrous, tuberculate-granular.—Distrib. Species 40, mostly in Africa and Mascarenia; 8 species are described by Miquel from Malaya, but these 8 are so closely allied that they might be described as 2.

The genus *Hypoestes* abounds in the Malay Archipelago, and the quantity of material from thence is very large. In India, again, *Hypoestes* is frequent. But from the Malay Peninsula I have only seen one collection, viz. Maingay 1176, here described.

1. Hypoestes malaccensis, Wight Ic. 1555 (before 1850). Pubescent, branched, 1 to 2 ft. high. Leaves up to 3 by 8 in., elliptic-lanceolate, narrowed at either end, entire, petiole 5 in. long. Involucres in axillary and terminal ovoid clusters 1 in. long; involucres 8 in. long, shortly conic at base, with 2 linear teeth. Calyx 25 in. long, minutely thinly hairy. Corolla 75 in. long. Pollen with 3 stopples. T. Anders. in Journ. Linn. Soc. IX. 522 (1867); C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 558; Lindau in Engl. & Prantl Pflanzenfam. IV. 3B, 333. H. rosea, Dene. in Nouv. Ann. Mus. III. 381 (Paris 1834) (non Beauv.).

Malacca: Griffith; Capt. A. C. Wight; Maingay (K.D.) 1176.— DISTRIB. Malay Islands.

With this is united (in Fl. Br. Ind. IV. 558) the Malay Archipelago species H. Decaisneana, Nees, and H. laxiflora, Nees, which differ very little.

35. Rungia, Nees.

Small undershrubs or herbs. Leaves opposite, equal. Flowers in peduncled spikes; floral leaves sometimes strobilate, including two bracts; lower bract longer than the calyx, upper smaller, sterile, nearly always empty. Sepals 5, nearly separate, linear. Corolla small, 2-lipped; tube oblong, short; lobes imbricated in the bud. Stamens 2;

1 anther-cell below the other usually appendaged; pollen ellipsoid, longitudinally banded. Ovary 4-ovulate; style at tip emarginate. Capsule small, with 4 or 2 seeds; placentæ rising elastically with the seeds, from the base of the capsule; seeds glabrous, minutely tuberculate.—Distrib. Species 35, mainly in India, extending to China, Australia, and Africa.

This genus can be separated from the small species of Justicia by the fruit.

1. Rungia laxiflora, C. B. Clarke. Suberect, 3 ft. high, nearly glabrous. Leaves: lamina 3.5 by 1.25 in., elliptic, narrowed at either end; petioles .25 to 1 in. long. Spikes 2 to 4 in. long, linear, flexuose, very lax; the outer bracts often scarcely imbricated. Bract (floral leaf) 9 mm. long, narrow-lanceolate, with scarious margins; the two prophylla lanceolate with scarious margins, the lower .3 in. long, the upper sterile, smaller. Sepals .275 in. long, linear, glabrous. Corolla .6 in. long, "pale yellow, striped with light grey" (Collector's note). Stamens 2; lower anther-cell smaller than the upper, with a white spur; pollen 50 μ long, with 3 stopples. Style glabrous, minutely hairy near the base. Capsule .35 in. long; minutely hairy; placentærising elastically; seeds minutely tubercled. ? Justicia laxiflora, Blume Bijdr. 789.

Perak: Scortechini; Larút, alt. 3000 ft., King's Collector 3676; alt. 100 ft., King's Collector 1815.—Distrib. Java (?).

Justicia laxiflora, Blume, has the filament "antice barbata," and could hardly be this. It was Zollinger, n. 1539 fide Moritzi Verz. Zoll. Pfl. 47, which I have not got. But I believe I got the name Rungia laxiflora from a Java plant marked Justicia laxiflora, which passed through my hands.

2. Rungia minutiflora, C. B. Clarke, n. sp. Suberect, a branched herb, 9 in. high. Leaves: blade 2 by ·75 in., ovate-lanceolate; tip obtuse, nearly glabrous, attenuated at base; petiole up to ·5 in. long. Spikes linear, 1 to 1·25 in. long, very lax, interrupted at base; flower-bract ·125 in. long, elliptic-obtuse, green, microscopically brown-hairy. Corolla ·2 in. long. Stamens 2; one anther-cell a little below the other distinctly tailed. Capsule ·15 to ·175 in. long; placentæ rising elastically from the valves; seeds brown, minutely tuberculated.

KEDAH: Lankawi Island, Curtis 3689.

Family XCI.—LABIATÆ.

[By D. Prain.]

Herbs, less often shrubs, usually beset with oil-glands. Stem usually 4-angled. Leaves opposite or whorled; exstipellate. Flowers irregular, solitary, 2-nate or fascicled, axillary or in centrifugal spicate cymes which by union in pairs form false whorls. Calyx persistent, nearly regular, or variously 4- to 5-cleft, or 2-lipped. Corolla gamopetalous, hypogynous; limb 4- to 5-lobed, or 2-lipped and personate, the lobes imbricate in bud. Stamens attached to the corolla-tube, usually 4 didynamous, sometimes the upper pair imperfect; anther-cells divaricate or parallel, sometimes disjoined, sometimes confluent. Disk usually prominent, regular or irregular. Ovary free, composed of two 2-celled carpels, the cells of which are also free; style simple, inserted between the lobes of the ovary; the stigma usually 2-lobed, its arms often unequal; ovules in each cell solitary, erect, anatropous. Fruit of 4 dry or rarely fleshy 1-seeded nutlets, rarely one or more of these abortive, situated at the base of the calyx; scar of attachment usually basal, small, occasionally lateral or sublateral and larger. Seeds small, erect, without albumen, or albumen very scanty; radicle inferior. — DISTRIB. Species about 2800, mainly in North Temperate regions.

Stamens 4, declinate:—	
Lowest corolla-lobe patent, flat or slightly concave, wide-	
based; calyx-limb 2-lipped; upper tooth much wider than	
the others; filaments free:—	
Corolla-tube very short, not or slightly exserted; stigma	
2-fid	1. Ocimum.
Corolla-tube long, usually far exserted; stigma entire or	
subentire	2. ORTHOSIPHON.
Lowest corolla-lobe deflexed, saccate or cymbiform, narrow-	
washased:	
Calyx-limb uniform; teeth 5, subequal; lowest corolla-lobe	
thick-edged, deeply saccate, not much longer than the	A TT
others; filaments free	3. Hyptis.
Calyx-limb 2-lipped; upper tooth often (not always) wider	
than the others; lowest corolla-lobe cymbiform, much	
longer than the others, its margin not thickened:—	4. PLECTRANTHUS.
Filaments free beyond point of insertion on corolla-tube Filaments connate in a sheath round the style	
Stamens not declinate: filaments free:—	5. Coleus.
Stamens 4. erect or spreading, equal or subequal: calvx-	

limb uniform; teeth 5, subequal; corolla-lobes 4, flat,

subequal:-

Anthers 1-celled; filaments bearded:-		
Whorls glomerulate in stout, lax, usually interrupted		
spikes	6.	Pogostemon.
Whorls aggregated in slender, dense, continuous spikes	7.	DYSOPHYLLA.
Anthers 2-celled, cells parallel; filaments not bearded;		
whorls sometimes terminal, usually axillary	8.	MENTHA.
Stamens ascending under upper lip of corolla; usually 4 didy-		
namous, the anterior pair the longer; sometimes 2, one pair		
being imperfect; corolla 2-lipped:—		
Calyx-limb distinctly 2-lipped:—		
Calyx-throat remaining open after flowering; tube without		
dorsal appendage, undivided in fruit and persistent:—		
Stamens two pairs; upper calyx-lip 3-toothed	Q	CALAMINTHA.
Stamens one pair, with remote anther-cells; upper calyx-		OAHAMINIHA.
lip 3-toothed or entire	10	Salvia.
Calyx-throat occluded after flowering; tube with a dorsal	10.	DALIVIA.
plate or pouch, 2-partite; the upper segment deciduous in		
fruit	11	Scutellaria.
Calyx-limb uniform, or, if oblique, not 2-lipped; the teeth	11.	GCUTELLIARIA.
subequal:—		
Anthers dimorphic; cells of anterior longer pair dimidiate,		
1-locular, of posterior shorter pair 2-locular; upper corolla-		
lip short, flattish, pubescent externally but not woolly;		
flowers medium, purplish; calyx-teeth 5, subequal	19	Anisomeles.
Anthers uniform; upper corolla-lip arched or hooded over	3.2.	ANIBUMELLES.
stamens:—		
Calyx-teeth 6 to 10; limb often oblique; upper corolla-		
lip densely woolly externally:—		
Lower corolla-lip shorter than upper; flowers large,		
vellow	13	LEONOTIS.
Lower corolla-lip longer than upper; flowers medium	10.	ELECTIONS.
or small, white	14	LEUCAS.
Calyx-teeth 5, subequal; limb uniform; upper corolla-lip		Lincons.
pubescent externally but not woolly:—		
Nutlets with a small basal or subbasal scar:—		
Nutlets dry; flowers medium:—		
Calyx-teeth spinescent; flowers purplish; leaves		
deeply incised	15.	LEONURUS.
Calyx-teeth herbaceous; flowers white or yellow;		
leaves not incised	16.	PARAPHLOMIS.
Nutlets fleshy; flowers large, yellow or white		Gomphostemma .
Nutlets with a large lateral scar; flowers very small,		
yellow	18.	CYMARIA.
이 사람이 되면 하면 보고 있다. 그 사람이 가는 그를 다른 다른 사람들이 되었다.		

1. Ocimum, Linn.

Strongly scented herbs or undershrubs. Flowers small, in 6- to 10-flowered whorls, spicate or racemose; pedicels recurved under the calyx; bracts small, caducous. Calyx ovoid or campanulate, in fruit

deflexed, 2-lipped; upper lip broad, flat, decurrent; lower usually with 4 slender teeth, the central pair exceeding the lateral. Corolla-tube short, not annulate within; limb 2-lipped; lower lip declinate, entire, flat or nearly so; upper rather shorter than lower, subequally 4-fid. Stamens 4, declinate, didynamous, exserted; filaments free or the lower pair connate below, naked or the upper toothed or hairy below; anther-cells confluent. Disk entire or 3- to 4-lobed. Style 2-fid; lobes subulate or flattened. Nutlets smooth or subrugose, mucilaginous when moistened.—Distrib. Species about 60, throughout the Tropics.

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Pedicels equalling or exceeding the calyx; two lower calyx-teeth longer than the upper lip . . . . . . 1. O. sanctum.

Pedicels much shorter than the calyx:—

Lower calyx-teeth longer than the upper lip . . . 2. O. Basilicum.

Lower calyx-teeth shorter than the upper lip . . . . 3. O. gratissimum.
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1. Ocimum sanctum, Linn. Mant. 85 (1767). An erect, softly hairy, much-branched herb, 1 to 2 ft. high. Stems and branches usually purplish, often woody at the base. Leaves opposite, membranous, pubescent on both surfaces, especially on the nerves and principally beneath, elliptic-oblong, obtuse or acute; base cuneate or truncate, entire; the margin elsewhere entire or serrate; 1 to 2 in. long, 6 to 1.2 in. wide; petiole 5 to 1 in. long, slender, pubescent. Flowers in slender racemes or panicles, 6 to 8 in. long, of rather close whorls; bracts ovate-acuminate, 12 in. long, ciliate. Calyx 12 in. (in fruit ·2 in.) long; pedicels longer than the calyx, slender, ·25 in. long, pubescent; lower lip of calyx longer than upper, its 4 teeth lanceolate, similar below; the central pair with long, slender, awn-like, upcurved tips, which project beyond the upper lip; the lateral pair with short straight tips; upper lip wide-obovate or suborbicular, reflexed, shortly apiculate. Corolla 15 in. long, purplish-pink; upper lip pubescent on the back. Filaments exserted, slender; the upper ones with a small bearded basal appendage. Nutlets 05 in. long, wide-ellipsoid, smooth, vellow with black markings. Roxb. Fl. Ind. III. 14; Wall. Cat. 2716; Benth. in DC. Prodr. XII. 38; Mig. Fl. Ind. Bat. II. 939; Hook. f. Fl. Br. Ind. IV. 609; Prain Beng. Plants 843. O. monachorum, Linn. Mant. 85. O. tenuiflorum, Linn. Sp. Pl. I. 597; Benth. in DC. Prodr. XII. 39. O. inodorum, Burm. Thes. Zeylan. 175, t. 80, f. 2.

In most of the provinces; in waste places. — DISTRIB. South-east Asia from Arabia eastwards; Australia; Pacific Islands.

This, the Sacred Tulsi of India, is no doubt an introduced plant in our area; where it is indigenous is uncertain.

2. OCIMUM BASILICUM, Linn. Sp. Pl. 597 (1753). An erect branching herb. 2 to 3 ft. high. Stems and branches usually green, sometimes purplish, glabrous or more or less hispidly hairy. Leaves opposite, membranous, green or purplish, variously pubescent, in extreme forms quite glabrous, in others strongly hispidly hairy, ovate-acute; base cuneate, entire: margin elsewhere entire or toothed or occasionally (in cultivated forms) deeply lobed; 1 to 2 in. long, 6 to 1.2 in. wide, occasionally, in cultivated varieties, larger; petiole 5 to 1 in. long. Flowers in rather dense racemes of whorls, the terminal raceme ultimately 6 to 8 in. long, much exceeding the lateral, rarely (var. thyrsoidea) with all the racemes subequal, forming a terminal thyrse; bracts ovateacute, petiolate. Calyx ·2 in. (in fruit ·35 in.) long; pedicels very short; lower lip with central pair of teeth longer than the upper lip, which is orbicular, longer than the campanulate tube. Corolla 35 to 5 in. long, variously white or pink or purplish, nearly or quite glabrous to pubescent or (var. ciliata) hispidulous. Filaments shortly exserted; the upper ones with a tooth above the base. Nutlets 07 in. long, ellipsoid, pitted. Wall. Cat. 2713; Hook. f. Fl. Br. Ind. IV. 608.

PERAK: Wray! PENANG: Wallich! MALACCA. Perhaps only cultivated in our area.—DISTRIB. Throughout Tropics of Eastern Hemisphere and Polynesia.

The presence of this species in Malacca is recorded by Sir J. D. Hooker (Fl. Br. Ind. l. c.), but there are not now any Malacca specimens at Kew. • In Penang it has only been collected by Wallich; his plant is a glabrous form never met with in India save in gardens. No complete specimens have been sent from Perak, but Wray records the species, under the name "Ruku," as an adulterant of Patchouli. "Ruku" is, however, the Malay name for Hyptis graveolens, which is one of the usual adulterants of Patchouli leaves, though the writer finds that samples of "Ruku" do contain, mixed with the leaves and calyces of Hyptis graveolens, calyces of O. Basilicum. The particular variety met with in these samples being var. pilosum, there is just a possibility that in Perak this may sometimes occur as an escape from cultivation.

3. Ocimum gratissimum, Linn. Sp. Pl. 1197 (1753). A shrubby, much-branched perennial, 4 to 6 ft. high, woody at the base. Stems glabrous; young branches pubescent. Leaves opposite, chartaceous, pubescent, elliptic-lanceolate, acute; base cuneate, entire; margin elsewhere coarsely crenate-serrate; 2.5 to 5 in. long, 1.5 to 2.25 in. wide; petiole 1 to 2.5 in. long, slender, pubescent. Flowers in simple or branched, strict, slender racemes; whorls rather close; rachis softly pubescent; bracts sessile, acuminate from a wide ovate base, exceeding the calyx, decussate and squarrose in young racemes. Calyx. 12 in. (in fruit .25 in.) long, pubescent, glandular; pedicels very short, softly

pubescent; lower lip with central pair of teeth minute and much shorter than the upper lip, which is rounded and recurved. Corolla ·17 in. long, yellowish- or greenish-white, externally pubescent. Filaments distinctly exserted; upper pair with a bearded tooth at the base. Nutlets ·06 in. long, subglobose, rugose, brown. Roxb. Fl. Ind. III. 17; Wall. Cat. 2720; Hook. f. Fl. Br. Ind. IV. 608.

Penang: Wallich. Almost certainly only cultivated in our area.— Distrib. Tropics generally, but doubtfully indigenous in America.

The only record of this species from our area is that of Wallich, who collected specimens in Penang in 1822. Seeing that no one has sent it since from any of the provinces, it may almost certainly be concluded that Wallich's specimens came from cultivated plants or from casual escapes that have not become permanently established.

2. ORTHOSIPHON, Benth.

Herbs, undershrubs, or shrubs. Flowers in 6- or fewer-flowered racemosely arranged whorls; bracts small. Calyx 2-lipped, ovoid or campanulate-tubular, deflexed in fruit; lower lip 4-toothed, the central and lateral teeth distinct or shortly connate, usually subulate; upper lip broad, membranous; the margins decurrent. Corolla 2-lipped; tube often slender, straight or incurved; lower lip entire, concave; upper lip 3- to 4-fid. Stamens 4, declinate, didynamous, included or exserted; filaments free, not appendaged at base; anther-cells confluent. Disk usually gibbous. Style with a small capitate or clavate, entire or notched stigma. Nutlets dry, ovoid or globose, smooth or nearly so.—Distrib. Species about 60, in Tropics of the Old World.

ORTHOSIPHON STAMINEUS, Benth. in Wall. Pl. As. Rar. II. 15 (1831). A slender glabrous or pubescent herb, 1 to 2 ft. high; stems distinctly quadrangular. Leaves opposite, membranous, usually puberulous to pubescent on the nerves on both surfaces, otherwise glabrous, rather dark-green above, ovate-acuminate, with long entire cuneate base; margin elsewhere coarsely wide-serrate; 2 to 4 in. long, .75 to 1.5 in. wide; petiole 25 to 4 in. long, puberulous or pubescent. Flowers in rather distant whorls, 6 in. apart below, these arranged in lax terminal racemes 4 to 8 in. long, 1.5 in. across, not including the far-exserted filaments. Calyx 15 in. (in fruit 25 in.) long, campanulate, puberulous on the nerves, gland-dotted between; the two central teeth of lower lip subulate. Corolla uniformly finely puberulous, 1 in. long, purplish or white; tube slender, straight, thrice as long as calyx; lower lip straight, 2 in. long; upper lip refracted, 2 in. long. Filaments glabrous, capillary, projecting 1.2 in. beyond corolla-limb. Nutlets wide-oblong, compressed, rugulose. Benth. Lab. Gen. & Sp. 29, and in DC. Prodr. XII.

52; Wall. Cat. 2727; Bot. Mag. t. 5833; Miq. Fl. Ind. Bat. II. 944; Hook. f. Fl. Br. Ind. IV. 615. Ocimum grandiflorum, Blume Bijdr. 835. O. longiflorum, Ham. in Wall. Cat. l. c.

Perak: Kunstler! Singapore: Deschamps! Nicobars: Kurz!— Distrib. South-eastern Asia and Australia.

3. Hyptis, Jacq.

Herbs or shrubs. Flowers small or medium, very variously arranged; in our species arranged in dense capitate or lax secund heads; bracts subulate or setaceous. Calyx 10-nerved, ovate or campanulate or tubular; teeth 5; subequal, erect. Corolla 5-lobed; lowest lobe abruptly deflexed, with thickened margin, saccate and contracted at the base; the other lobes erect or spreading, flat. Stamens 4, declinate; flaments free, without basal appendages; anther-cells confluent. Disk entire, regular or somewhat gibbous in front. Style with subentire or 2-fid stigma. Nutlets oblong or ovoid, smooth or rugulose.—DISTRIB. Species about 250, all American; a few introduced and established in the Tropics of the Old World.

Flowers in dense, globose, axillary, many-flowered heads Flowers in lax, secund, racemose, few-flowered heads .. 1. H. brevipes.

.. 2. H. suaveolens.

1. Hyptis brevipes, Poit. Ann. Mus. Par. VII. 465 (1806). An erect annual herb, 2 to 3 ft. high. Stems glabrate or pilose. Leaves opposite, membranous, medium-green and sparsely hispid throughout above, paler and pubescent on the nerves beneath, ovate-oblong or lanceolate; apex acute; base long-cuneate, entire; margin elsewhere serrate; 2 to 3 in. long, '75 to 1 in. wide; petiole '25 to '5 in. long. Flowers in dense heads, '4 in. in diam., on axillary, hispid, slender peduncles '4 to '5 in. long; bracts ciliate, lanceolate or subulate, rigid, '2 in. long. Calyx subtubular, '1 in. (in fruit '15 in.) long, ciliate; teeth erect, subequal, subulate, as long as the tube. Corolla '2 in. long; tube slender. Nutlets ovoid, brown, minutely rugulose. Benth. in DC. Prodr. XII. 107; Miq. Fl. Ind. Bat. II. 959; Hook. f. Fl. Br. Ind. IV. 630.

Malacca: Griffith 3961! Penang: King! Singapore: Kunstler! Perak: Scortechini! Andamans: at Port Blair, King!—Distrib. America, from Brazil to Mexico; Tropical Africa and the Malay Archipelago, introduced.

Hyptis capitata, Jacq., a species in habit resembling H. brevipes, is frequently met with in gardens in S.E. Asia. It sometimes occurs spontaneously in waste places in India, and appears to have become established in the Philippines and in Formosa. The

possibility of its occurrence in our area should therefore be kept in mind. It is readily distinguished from H. brevipes by its much larger capitula, which reach '75 in. across, and by its calyx-teeth being shorter than the tube. There is nothing in the description of the mysterious Leucas globulifera (Hassk. Cat. Hort. Bogor. alt. 133), which finds a place in various works of reference and which is obviously not a Leucas, to prevent it from having been Hyptis capitata in cultivation, as Hasskarl says, at Buitenzorg. Hasskarl's small 2-fid upper lip may stand for the two upper corolla-lobes, the lateral lobes of the lower lip being the two lateral corolla-lobes; the concave mid-lobe, largest of the three in what Hasskarl terms the lower lip, explains itself. Every other character agrees with Hyptis capitata, and the combination of characters will fit no other Labiate known to the writer as likely to be in cultivation in Java when Hasskarl wrote.

2. Hyptis suaveolens, Poit. Ann. Mus. Par. VII. 472, t. 29, f. 2 (1806). A rigid, branching, annual herb, 2 to 4 ft. high. Stems hirsute. Leaves opposite, firmly herbaceous, dark-green, pilose above, paler, densely grey-pubescent beneath, rather wide-ovate, subacute; base rounded, truncate or slightly cuneate, rarely subcordate; margin sinuate and serrulate; .75 to 3 in. long, .6 to 2 in. wide; petiole slender, 35 to 75 in. long, sparingly pubescent. Flowers in lax fewflowered, secund heads, 5 in. long, arranged racemosely towards ends of branches in the axils of smaller leaves, on pubescent peduncles 5 in. long; bracts minute, setaceous. Calyx campanulate, 2 in. (in fruit ·35 in.) long, strongly ribbed; mouth villous; teeth erect, subulate, shorter than tube. Corolla blue, 3 in. long; tube slender. narrowly oblong, brown, faintly rugose. Benth. in DC. Prodr. XII. 126: Mig. Fl. Ind. Bat. II. 959; Hook. f. Fl. Br. Ind. IV. 630. Ballota suaveolens, Linn. Sp. Pl. 815. Bysteropogon suaveolens, L'Hérit. Sert. Angl. 19. B. graveolens, Blume Bijdr. 824. Schauera graveolens, Hassk. in Flora, 1842, II. Beibl. 25.—Malay name "Ruku."

PEBAK: Wray! MALACCA: Maingay 2280! PENANG: Deschamps! NICOBARS: Kurz 26063!—Distrib. Tropical America; introduced and widely spread in South-east Asia.

Leaves largely used, along with those of *Urena lobata*, Linn., in adulterating commercial samples of leaves of *Pogostemon Cablin*, the Patchouli plant principally cultivated in our area.

4. Plectranthus, L'Hérit.

Herbs or undershrubs. Flowers usually small, generally in lax, paniculate, 6- to 8-flowered cymes. Calyx 5-toothed, 2-lipped, enlarging in fruit. Corolla-tube exserted, long or short, decurved or straight; limb gibbous or sometimes spurred, less often straight, 2-lipped; lower

lip entire, long boat-shaped; upper short, 3- to 4-fid, recurved. Stamens 4, declinate; filaments free, simple; anther-cells usually confluent. Disk usually produced anteriorly, there nearly to fully as long as the ovary. Style usually 2-fid. Nutlets orbicular or occasionally oblong or ovoid, smooth, granulate or punctate.—DISTRIB. Species about 100, in the Tropics of the Old World, Australia and Polynesia.

PLECTRANTHUS KUNSTLERI, Prain Journ. As. Soc. Beng. LXVI. ii. 521 (1897). A stoutish shrubby plant, 2 to 5 ft. high, everywhere finely puberulous. Leaves opposite, membranous, pale-green especially beneath and there sparsely glandular-puberulous, darker and similarly faintly puberulous above, sometimes with a whitish line down the centre, ovate-acute with entire, cuneate base and short, entire, subacuminate apex; margin elsewhere regularly crenate; 3 to 4.75 in. long, 1.5 to 2 in. wide; petiole 1.5 to 2 in. long. Flowers in racemed cymes disposed in stout panicles with ascending branches, 6 in. long, 4 in. across. Calyx in fruit 2 in. long, gland-dotted; pedicels 15 in. long, finely puberulous; the two lower teeth subulate, the two lateral ovate-acute, longer than the upper orbicular-ovate. Corolla greenishwhite, or waxy white, faintly dotted, '4 in. long; the tube decurved with a gibbous base, one and a half times as long as the boat-shaped lower lip; upper lip rather short. Filaments discrete from the point at which they are free from the corolla-tube. Nutlets oblong, brown, hardly shining. Ann. Roy. Bot. Gard. Calc. IX. i. 55, t. 70.

PERAK: Kwala Dipong, 400 to 600 ft. elev., King's Collector (Kunstler) 8240! Kinta, 800 to 1000 ft., King's Collector (Kunstler) 7143! On limestone ridges.

5. Coleus, Lour.

Herbs. Flowers usually small, generally in lax, paniculate, 6- to 8-flowered cymes. Calyx 5-toothed, 2-lipped, enlarging in fruit. Corolla-tube exserted, long or short, decurved or straight; limb gibbous or less often straight, 2-lipped; lower lip entire, long boatshaped; upper short, 3- to 4-fid, recurved. Stamens 4, declinate; filaments combined below into a sheath around the style; anther-cells usually confluent. Disk usually produced anteriorly. Style usually 2-fid. Nutlets orbicular, oblong or ovoid, smooth, granulate or punctate.—Distrib. Species about 80, in the Tropics of the Old World and in Australia.

Coleus atropurpureus, Benth. in Wall. Pl. As. Rar. II. 16 (1831). A herb 2 to 3 ft. high, everywhere finely pubescent. *Leaves* opposite, membranous, dark-green above, rather closely puberulous on the nerves, elsewhere sparingly so, paler beneath and pubescent on the main and

secondary nerves, ovate-acute, with entire rounded rarely cuneate base, and short, entire, blunt apex; margins elsewhere rather widely crenate; 2 to 4 in. long, 1·25 to 1·75 in. wide; petiole 1 to 2 in. long. Flowers in irregularly branched cymes disposed in stoutish thyrses 3 to 6 in. long, 1·5 in. across; bracts ovate-acute, pubescent, ·15 in. long, deciduous. Calyx in fruit ·2 in. long, sparingly gland-dotted; pedicels ·2 in. long, pubescent; the two lower teeth subulate, the two lateral oblong-obtuse, shorter than the upper ovate-subacute. Corolla blue and white, ·35 in. long; the tube abruptly decurved, shorter than the lower lip; upper lip very short. Filaments connate far beyond point of attachment to corolla-tube. Nutlets orbicular, brown, almost shining. Benth. Lab. Gen. & Spec. 54 and in DC. Prodr. XII. 74; Wall. Cat. 2733; Nunes Fl. Filip. t. 208; Miq. Fl. Ind. Bat. II. 951; Hook. f. Fl. Br. Ind. IV. 626.

In most of the Provinces.—DISTRIB. Malay Archipelago; Philippines; Polynesia.

6. Pogostemon, Desf.

Herbs or undershrubs, often strongly scented. Leaves usually opposite. Flowers small, in simple or paniculate spikes or contracted racemes formed of many dense-flowered subcapitate whorls. Calyx almost equally 5-toothed. Corolla 2-lipped; upper lip 3-lobed, the lobes subequal or the central one rather longer and narrower than the lateral ones; the lower lip flat, patent, entire. Stamens 4, exserted, straight or declinate, the lower pair rather shorter than the upper; filaments bearded; anther-cells confluent. Disk subentire, uniform. Style shortly 2-fid, the arms subulate, subequal. Nutlets smooth, ovoid or ellipsoid.—Distrib. Species about 30, throughout Southeastern Asia.

Leaves membranous, sparingly puberulous or almost glabrous; whorls separated by distinct interspaces throughout the spikes; corolla glabrous externally, except for a few hairs on margin of lower lip 1. P. Heyneanus. Leaves herbaceous, densely pubescent, especially beneath; whorls contiguous throughout the spikes or only the lowest separated by an interspace; corolla uniformly pubescent externally 2. P. Cablin.

1. Pogostemon Heyneanus, Benth. in Wall. Pl. As. Rar. I. 31 (1830). An erect branching herb, 2 to 4 ft. high. Stems and branches slender, sparsely pubercent. Leaves opposite, thinly membranous, very sparingly puberulous or sometimes almost glabrous on both surfaces,

medium-green above, pale-green beneath, ovate-acute; base widecuneate, entire; margin elsewhere crenate, each lobule again crenulate; 2.5 to 4 in. long, 1.5 to 2.75 in. wide; petiole 1 to 1.5 in. long, very sparingly puberulous. Flowers in slender, simple or paniculately branching terminal spikes 3 to 6 in. long; whorls at the base 5 to 75 in. apart, gradually more approximate upwards, but those near the apex still .2 to .15 in. apart; whorls .4 in. across; bracts elliptic, acute, sparingly puberulous, 15 in. long or less. Calyx 15 in. (in fruit 2 in.) long, sparingly pubescent externally; teeth triangular, one-third the length of the tube, equal and similar. Corolla 2 in. long, glabrous externally save for a few hairs on margin of lower lip. Filaments exserted, almost straight, all bearded. Style-arms short, only onetenth to one-eighth the length of the style. Nutlets wide-ovate, 02 in. long, dark-brown with a paler base, smooth. Benth. Lab. Gen. & Sp. 154, and in DC. Prodr. XII. 153; Wight Ic. t. 1440; Cooke Fl. Bomb. II. 455. P. Patchowli, Dalz. & Gibs. Bomb. Fl. Addend. 66 (not P. Patchouly, Pellet.). P. Patchouli, Hook. f. Fl. Br. Ind. IV. 633 (not P. Patchouly, Pellet.).

SINGAPORE: G. Thomson. Malacca: Griffith, 3966! Selangor: Rawang, Ridley 7603! Cultivated or as an escape from cultivation.—DISTRIB. India and Ceylon; where, however, it is only known as a cultivated plant or as an escape from cultivation.

This, the Indian "Patchouli." if one may judge from the specimens communicated, is the plant first introduced to our area on account of its peculiar scent. There is nothing to indicate whether it was formerly at all extensively cultivated; it does not appear to be so now.

2. Pogostemon Cablin, Benth. in DC. Prodr. XII. 156 (1848). An erect, rather stout, branching undershrub, 2 to 5 ft. high. Stems and branches stout, distinctly swollen under the nodes, densely hoary-pubescent. Leaves opposite, herbaceous, closely densely pubescent on both surfaces, especially beneath, dark-green above, medium-green below, ovate-acute; base shortly cuneate or subtruncate, entire; margin elsewhere usually deeply lobate, the lobes crenate; rarely margin simply crenate or in upper leaves almost entire; 3 to 4 in. long, 2 to 3 in. wide; petiole 1.5 to 2.5 in. long, densely hoary-pubescent. Flowers in stout simple spikes terminating the stem and the branches, 1.5 to 4 in. long, the lowest whorl sometimes 5 to 6 in. remote from the next, the rest or all the whorls closely aggregate; whorls .75 in. across or more; bracts elliptic, acute, densely pubescent, .2 to .35 in. long. Calyar .2 in. (in fruit .25 in.) long, densely pubescent, especially along the nerves; teeth triangular, one-third the length of the tube,

equal and similar. Corolla 3 in. long, the throat and lips uniformly pubescent externally. Filaments exserted, almost straight, all bearded. Style-arms rather long, one-fifth to one-fourth the length of the style. Nutlets not seen ripe. P. Patchouly, Pellet. in Mem. Soc. Sc. Orleans V. 277, t. 7. P. suavis, Ten. in Giorn. Bot. Ital. II. 56. P. Patchouli, Hook. Kew Journ. Bot. I. 328, t. 11. P. Patchouli var. suavis, Hook. f. Fl. Br. Ind. IV. 634. Mentha Cablin, Blanco, Fl. Filip. 473. M. auricularia, Blanco Fl. Filip. ed. 2, 329 (not of Linn.).

PERAK: Wray! PENANG: Wallich! Curtis! Cultivated only, in our area.—DISTRIB. Philippines; where, according to Loher, it occurs only in gardens.

This plant seems to flower not infrequently in the Philippines; there are specimens from thence at Kew collected both by Vidal and by Loher. So far as is known, it has flowered only three times in Europe: once in France, recorded by Pelletier (1844); once in Italy, recorded by Tenore (1847); once in England, recorded by Sir W. J. Hooker (1849): Hooker's plant was obtained from Tenore. No flowering specimen has ever been communicated from our area where, according to Wray and Curtis, it is extensively cultivated by Chinese settlers. In the Royal Botanic Garden at Calcutta the plant has been in continuous cultivation since 1834, when Wallich first obtained it from Penang; at Saharanpur, whence it was distributed from the Calcutta Garden, it has also been long in cultivation. At Calcutta and at Saharanpur all attempts to induce the plant to flower have consistently failed.

This, which may be termed the Malayan, as opposed to the original or Indian Patchouli, is not known to be cultivated anywhere in India except in botanical gardens.

There are indications that a third kind of Patchouli plant, the Chinese Patchouli (Microtoena cymosa, Prain), had at one time been introduced, not impossibly by Chinese settlers, to Java. But its cultivation has not persisted in the Malayan Archipelago, and there is no indication that it was ever introduced to the Peninsula. The Chinese Patchouli seems at one time to have been cultivated to a considerable extent in North-eastern India, and to have competed in the Calcutta market with the Indian Patchouli (Pogostemon Heyneanus). Now, however, the Malayan Patchouli, the product of Pogostemon Cablin, appears to have so completely supplanted both the others that neither are offered for sale, and the cultivation of Pogostemon Heyneanus is restricted to native gardens in the Indian Peninsula, while that of Microtoena cymosa only lingers in a few native gardens in the Khasia Hills.

In commercial samples of the leaves of Pogostemon Cablin, various extraneous leaves are to be met with. The chief of these are leaves of Hyptis suaveolens, Poit., in our area known as "Ruku," also leaves of Urena lobata, Linn., known in our area as "Perpulut." With Hyptis suaveolens, and under the same name "Ruku," are associated the leaves of Ocimum Basilicum, Linn., var. pilosum. These, however, are in much smaller quantity than those of the Hyptis.

7. Dysophylla, Bl.

Herbs. Leaves opposite or whorled. Flowers minute, in dense long spikes composed of numerous close-set many-flowered cymes. Calyx minute, ovoid, 5-toothed; teeth subequal; throat naked within. Corolla minute; tube exserted or included, limb equally 4-fid; upper lobe entire or notched, lower spreading, Stamens 4, exserted, straight or nearly so; filaments bearded, very long; anther-cells confluent. Disk equal, subentire. Style 2-fid. Nutlets ovoid or oblong, smooth or granulate.—Distrib. Species about 15, in Tropics of Old World and Australia.

Dysophylla Auricularia, Blume Bijdr. 826 (1826). A coarse annual herb. Stems laxly branched, rarely simple, 1 to 2 ft. high, pubescent with spreading hairs. Leaves opposite, membranous, rather pale-green, especially beneath, with numerous scattered hairs above and with similar hairs on the nerves beneath, ovate or oblong-ovate, acute or rarely obtuse, with entire cuneate or rounded base; margins elsewhere coarsely serrate; 1 to 2.75 in. long, 5 to 1 in. wide; petiole 1 to 4 in. long. Flowers in villous cylindric terminal spikes 1.5 to 3 in. long, ·2 to ·35 in. in diam.; whorls of cymes close-set throughout. Calyx in fruit 1 in. long, subcampanulate, gland-dotted; teeth subequal, triangular, incurved over the nutlets. Corolla 1 in. long, pinkish; tube slender, much exserted; lobes short, pubescent. Filaments exserted, densely villous. Nutlets ellipsoid, almost smooth. Benth. Lab. Gen. & Sp. 158, in DC. Prodr. XII. 156, and in Wall. Pl. As. Rar. I. 30; Wall. Cat. 1548; Wight Ic. t. 1445; Hook. f. Fl. Br. Ind. IV. 638. Mentha auricularia, Linn. Mant. 81; Roxb. Fl. Ind. III. 4; Griff. Notul. IV. 200. M. fætida, Burm. Fl. Ind. 126.

In all the provinces.—DISTRIB. Throughout South-east Asia.

8. Mentha, Linn.

Strongly scented perennial herbs with creeping rootstocks. Flowers small, in usually many-flowered terminal spikes or axillary whorls; bracts small or large. Calyx tubular or campanulate, 10-ribbed, 5-toothed; teeth subequal. Corolla-tube infundibuliform, short; lobes 4, the uppermost rather wider than the other three, emarginate. Stamens 4, usually dimorphic, subequal; filaments free, erect, distant; anthers 2-celled; cells parallel. Disk entire, uniform. Style-arms short, subequal. Nutlets ovoid, smooth or reticulate.—Distrib. Species variously estimated—perhaps not more than 30 in reality—mainly in North Temperate regions, but some now widely dispersed in all parts of the world.

Mentha Javanica, Blume Bijdr. 826 (1826). A prostrate herb, rooting

below. Stems 1 to 2 ft. long, pubescent with reflexed adpressed hairs. Leaves opposite, membranous, harshly hairy above, glabrous beneath, rather wide-lanceolate, acute; base long-cuneate, entire; margin elsewhere serrate; 1 to 2 in. long, 25 to 35 in. wide; petiole 25 in. long or shorter; floral leaves like those on the stem below the whorls. Flowers in axillary capitate distant whorls; bracts acute, shorter than the flowers. Calyx 1 in. long, tubular-campanulate, adpressed-pubescent; teeth lanceolate, acute, longer than the tube. Corolla 15 in. long, pubescent. Benth. in DC. Prodr. XII. 173. M. sativa, Roxb. Fl. Ind. III. 6 (hardly of Linn.). M. arvensis, Thw. Enum. Pl. Zeyl. 239; Trim. Fl. Ceyl. III. 381 (hardly of Linn.). M. arvensis var. javanica, Hook. f. Fl. Br. Ind. IV. 648.

Malacca: Griffith!—Distrib. Ceylon; Java; Philippines.

Apparently rare, and possibly an introduced plant in our area, seeing that it has never been reported since Griffith met with it. As Sir J. D. Hooker remarks, this, which is Roxburgh's M. sativa, may really be a form of M. sativa, Linn., and, if so, may only be a state of M. arvensis, Linn., to which Boissier refers M. sativa, and to which Thwaites refers the present plant. For the purposes of a local flora, however, it seems better to keep this form, which is easily recognized, apart as a distinct species.

9. CALAMINTHA, Mœnch.

Herbs or shrubs. Flowers small or medium, in dense axillary or loose spicate or racemose or panicled whorls. Calyx 13-nerved, 2-lipped; lower lip 2-toothed, teeth narrow; upper lip 3-toothed, teeth wider and more highly connate; throat naked or villous. Corolla-tube straight, throat villous; lower lip spreading, 3-lobed; upper lip erect, flattish. Stamens 4, didynamous, ascending under upper lip, the upper pair sometimes imperfect; anther-cells parallel or divaricate. Disk uniform, entire. Style-lobes equal or the upper smaller. Nutlets minute, subglobose, smooth.— Distrib. Species about 40, in North Temperate regions.

Calamintha gracilis, Benth. in DC. Prodr. XII. 232 (1848). A slender prostrate herb. Stems 8 to 12 in., faintly puberulous, rooting below. Leaves opposite, membranous, glabrous on both sides, dark-green above, paler beneath, ovate-subacute; base rounded or shortly cuneate, entire; margin elsewhere serrate; '4 to '6 in. long, '3 to '5 in. wide; petiole '25 in. long, puberulous. Flowers in lax many-flowered whorls in axils of uppermost leaves, and there remote or aggregated in racemose or subcapitate terminal racemes, with rachis sparsely pubescent; bracteoles subulate, finely puberulous, half as long as slender pedicels. Calyx '12 in. (in fruit '17 in.) long; tube slightly inflated below; lower teeth subulate, ciliate, incurved; upper lip shortly 3-toothed, recurved; teeth

ovate; pedicels ·12 in. long, puberulous. Corolla ·2 in. long. Nutlets ·02 in., pale-brown, smooth.

Perak: Thaiping, Ridley 11912!—Distrib. Java; Assam.

This species is not included in the 'Flora of British India.' It was obtained by the late Mr. C. B. Clarke, at Dibrugarh in Upper Assam, subsequent to the appearance of the account of the Indian species of this family by Sir Joseph Hooker.

10. SALVIA, Linn.

Herbs, undershrubs or shrubs. Flowers small, medium, or large and showy; whorls usually in racemes or spikes; bracts small or large, sometimes coloured. Calyx campanulate or tubular, 2-lipped; mouth naked; upper lip entire or 3-toothed; lower lip 2-fid. Corolla 2-lipped; tube naked or annulate within; lower lip 3-lobed, the central lobe usually wider than the lateral, entire or emarginate; upper lip erect. Stamens 2, the upper pair imperfect, represented by small staminodes or obsolete; filaments short, articulating with a slender connective, and sometimes produced beyond the joint; connective linear, transverse, with an upper ascending arm which bears a linear fertile anthercell, and a lower straight or deflexed arm bearing a cell which may be empty or fertile or bearing no cell. Disk usually enlarged anteriorly. Style shortly 2-fid; the lobes usually subulate, equal or the lower larger, sometimes flattened. Nutlets ovoid, somewhat triquetrous, smooth.—Distrib. Species about 450, cosmopolitan.

Flowers rather large, showy; corolla-tube long, far exserted ... 1. S. coccinea. Flowers minute, inconspicuous; corolla-tube short, not exserted ... 2. S. plebeia.

1. Salvia coccinea, Juss. ex Murr. in Comm. Gott. I. 86, t. 1 (1778). A slender herb, 1 to 3 ft. high. Stems numerous, 4-angled, ascending, often branched, finely pubescent. Leaves opposite, membranous, glabrous above, finely white-pubescent beneath, dark-green, ovate- or cordate-acute, crenate except the base; 1 to 1.5 in. long, .75 to 1 in. wide; petiole slender, finely puberulous, .6 to .8 in. long. Flowers in 6- to 10-flowered remote whorls disposed in terminal racemes; bracts ovate-acuminate, deciduous; pedicels .12 in. long, slender, puberulous. Calyx .25 in. (in fruit .35 in.) long, pubescent, striate, narrowly campanulate; upper lip entire, obtuse; lower 2-fid; the lobes acute. Corolla .75 in. long, red; tube straight, much exserted, widened upwards; lower lip spreading, 3-fid; upper lip short, erect. Nutlets .08 in. long, very narrowly oblong, smooth, brown, shining. Linn. f. Suppl. 88; Benth. in DC. Prodr. XII. 343; Hook. f. Fl. Br. Ind. IV. 656. S. Gerardiana, Benth. in Wall. Cat. 2150.

SINGAPORE: Kurz! Malacca: Maingay 1167! 1778! Andamans: Port Blair, Kurz!—Distrib. America, where indigenous; Africa and South-east Asia, where generally cultivated and often as an escape from gardens.

2. Salvia plebeia, R. Br. Prodr. 501 (1810). An erect herb, 6 to 18 in. high. Stems obtusely 4-angled, grooved, hoary-pubescent. Leaves opposite, membranous, sparsely hirsute or nearly glabrous, oblong-oblanceolate, obtuse or subacute; base usually cuneate, entire; margin elsewhere irregularly crenate; 2 to 4 in. long, '75 to 1.75 in. wide; petiole 1 to 2 in. long. Flowers in paniculate or subthyrsoid, interrupted, pubescent, spicate racemes; bracts small, linear-spathulate; pedicels short. Calyx ·1 to ·12 in. (in fruit ·18 to ·2 in.) long, campanulate, 2-lipped; upper lip obtuse, entire, lower 2-fid; the lobes acute or subacute. Corolla small, ·15 in. long, whitish; lower lip 3-lobed, the mid-lobe exceeding the lateral ones; upper lip oblong, obtuse. Nutlets ·04 in. long, ovoid, smooth, brown. Benth. Lab. Gen. & Sp. 309, and in DC. Prodr. XII. 355; Miq. Fl. Ind. Bat. II. 970; Hook. f. Fl. Br. Ind. IV. 655. S. brachiata, Roxb. Fl. Ind. I. 145; Wall. Cat. 2149.

Malacca: perhaps also in some of the other provinces.—DISTRIB. South-east Asia generally; Australia. A very common Indian field-weed, but in our area apparently extremely rare and perhaps only introduced.

11. SCUTELLARIA, Linn.

Herbs or undershrubs. Flowers often in long narrow racemes. Calyx campanulate, 2-lipped; lips closed in fruit, ultimately free to the base, the upper at length deciduous, with a deciduous dorsal scale or pouch, the lower persistent. Corolla 2-lipped; tube long, usually abruptly recurved beyond the calyx and ascending, dilated at the throat, not annulate within; lower lip wide, 3-lobed, the lateral lobes small and often connate with upper lip, which is erect, galeate, entire or notched. Stamens 4, didynamous, the upper pair shorter, ascending under the hooded upper lip; anthers connivent, ciliate, those of upper stamens 2-celled, of lower 1-celled. Disk elongate. Style 2-fid; upper lobe very short. Nutlets subglobose, smooth, granulate or hispidulous.—Distrib. Species about 90, mainly in the Northern Hemisphere.

Pubescent; leaves purple beneath; corolla pale-blue ... 1. S. discolor. Glabrous; leaves green beneath; corolla dark-blue, with white centre of lower lip ... 2. S. andamanica.

1. Scutellaria discolor, Colebr. in Wall. Pl. As. Rar. I. 66 (1830). A slender pubescent herb. Stems ascending from a creeping rootstock, 1 to 2 ft. high; rarely branched, often naked above. Leaves opposite, and crowded towards the base of the stem, pubescent on both sides, often purple beneath, elliptic, obtuse; base rounded or cordate; margin crenate; 1·5 to 4 in. long, ·75 to 2·5 in. wide; petioles 1 to 3 in. long. Flowers disposed in slender racemes 2 to 8 in. long; rachis pubescent; bracts ·1 to ·15 in. long; pedicels ·1 in. long. Calyx ·12 in. (in fruit ·2 in.) long, pubescent. Corolla pale-blue, faintly puberulous externally, ·5 to ·6 in. long; tube ·4 in. long; throat somewhat dilated; lower lip 3-lobed; upper lip galeate, obtuse. Nutlets ·03 in. long, scabrid. Benth. in DC. Prodr. XII. 417; Hook. f. Fl. Br. Ind. IV. 667. S. indica, Blume Bijdr. 839; Wall. Cat. 2134 (not of Linn.). S. heteropoda, Miq. Fl. Ind. Bat. II. 972.

Perak: Scortechini. — Distrib. India; Indo-China; Malay Archipelago.

2. Scutellaria and Andrica, Prain Journ. As. Soc. Beng. LIX. ii. 307 (1890). A slender glabrous undershrub. Stems many from a woody rootstock with clustered rootlets, 8 to 10 in. high, simple or branched. Leaves opposite, rather few, oblong-lanceolate, obtuse; base long-cuneate, entire; margin elsewhere crenate-dentate; 1.5 to 1.75 in. long, 4 to 6 in. wide; petiole 1 to 1.5 in. long. Flowers opposite above, in whorls of three below, in slender racemes 3 to 4 in. long; bracts 12 in. long; pedicels 12 in. long. Calyx 12 in. (in fruit 2 in.) long, glabrous. Corolla blue, with centre of lower lip white; 6 in. long; throat little dilated; lower lip 3-lobed; upper lip galeate. Nutlets 04 in. long, scabrid, pale-brown. Ann. Roy. Bot. Gard. Calc. IX. i. 56, t. 71 a.

Andamans: Port Blair, in stream beds, not uncommon.

12. Anisomeles, R. Br.

Herbs, with tall coarse branching stems. Flowers medium, in axillary whorls, or in lax branching paniculate cymes. Calyx ovoid or tubular, straight, equally 5-toothed. Corolla-tube short, annulate within; lower lip 3-lobed, broad and patent, the mid-lobe retuse or notched; upper lip entire, erect. Stamens exserted; anthers connivent, those of the lower and longer pair dimidiate; of the shorter upper pair 2-celled; the cells parallel, transverse. Disk equal. Style subequally 2-fid. Nutlets smooth.—Distrib. Species about 8, Southeastern Asiatic and Australian.

Stems and branches acutely 4-angled, softly pubescent to glabrate; corolla pale-purple; calyx-teeth about as long as the tube 1. A. ovata.

Stems and branches obtusely 4-angled, densely white woolly; corolla dark-purple; calyx-teeth much shorter than the tube ... 2. A. malabarica.

1. Anisomeles ovata, R. Br. in Ait. Hort. Kew. ed. 2, III. 364 (1811). A stoutish shrubby plant, with acutely 4-angled stems and branches, 2 to 5 ft. high, sparingly hairy to densely pubescent or almost woolly. Leaves opposite, thickly herbaceous, uniformly hairy to woollytomentose on both sides, rather pale-green; ovate-acute with entire truncate, rounded, or subcordate, less often shortly cuneate base; margin elsewhere crenate-serrate; 1.5 to 4 in. long, 1 to 2.25 in. wide, rarely rather larger low down on the stem; petiole 6 to 1.5 in. long. Flowers in dense whorls, distant below, approximate above in a dense spicate inflorescence; in fruit the cymes sometimes subsecundly explanate; bracts 15 to 2 in. long, linear, beset with long firm hairs. Calyx ·25 in. (in fruit ·35 in.) long, subsessile, hirsute with firm hairs; teeth lanceolate, acute, almost as long as tube, hairy within and without, Corolla 6 in. long, light-purple with blue lower lip; tube 2 in. long; lower lip 4-lobed from deep division of the middle segment into two oblong lobes; the lateral lobes small, rounded; upper 25 in long, oblong, entire. Filaments hirsute. Nutlets 1 in. long, wide-ovate. subcompressed; inner face bluntly angular, outer rounded, smooth, shining, nearly black. Wall. Cat. 2040; Jacq. Eclog. I. t. 86; Hook. Bot. Misc. II. 358, Suppl. t. 19; Benth. in Wall. Pl. As. Rar. I. 59, and in DC. Prodr. XII. 455; Wight Ic. t. 865; Miq. Fl. Ind. Bat. II. 975; Hook. f. Fl. Br. Ind. IV. 672. A. disticha, Heyne in Roth Nov. Sp. 254; Roxb. Fl. Ind. III. 2. A. glabrata, Benth. in Wall. Cat. 2041. A. mollissima, Wall. Cat. 2039. A. indica, O. Kuntze Rev. Gen. Nepeta indica, Linn. Sp. Pl. 571. N. amboinica, Linn. f. Suppl. 273. N. disticha, Blume Bijdr. 823. Ballota disticha, Linn. Mant. 83. B. mauritiana, Pers. Syn. II. 126. Ajuga disticha, Roxb. Marrubium indicum, Burm. Fl. Ind. 127. Fl. Ind. III. 2. odoratissimum, Burm. Thes. Zeylan. t. 71, f. 1. Monarda zeylanica, Burm. Fl. Ind. 12.

In all the provinces, in waste places.—DISTRIB. South-eastern Asia generally; China.

A very variable plant as regards tomentum; the extreme forms being A. glabrata, Benth., which is only sparsely hairy, and A. mollissima, Wall., which is densely softly woolly-pubescent. The two forms mentioned are probably deserving of separation as varieties; intermediate states, however, occur.

2. Anisomeles Malabarica, R. Br. in Bot. Mag. t. 2071 (1819). An erect shrubby plant, with obtusely 4-angled stems and branches, 4 to 6 ft. high, densely tomentose or thickly woolly. Leaves opposite, very thickly herbaceous, pale-green above, white below, uniformly softly woolly tomentose, oblong-lanceolate, acute, with entire rounded or shortly cuneate base; margin elsewhere crenate-serrate; 2.5 to 4 in. long, 75 to 1.75 in. wide; petiole 5 in. long, stout, softly woolly. Flowers in dense whorls, distant below, approximate above, often 1.25 in. across, forming an interrupted spicate inflorescence; bracts 4 to 5 in. long, linear, acute, densely softly woolly. Calyx ·3 in. (in fruit ·4 in.) long, subsessile, densely villous; teeth about half as long as tube, narrowly lanceolate, acute, villous externally and internally, ciliate. Corolla 8 in. long, dark-purple, somewhat pubescent externally; tube ·35 in. long; lower lip 4-lobed from deep division of the middle segment into 2 oblong obtuse lobes; upper lip ·35 in. long, obtuse. Filaments pubescent. Nutlets 12 to 15 in. long, ellipsoid, compressed, inner face faintly angled, outer rounded, smooth, shining, brown. Wall. Cat. 2037; Hook. Journ. Bot. I. 225, t. 127; Wight Ic. t. 864; Benth. in Wall. Pl. As. Rar. I. 59, in Lab. Gen. & Sp. 704, and in DC. Prodr. XII. 456; Hook. f. Fl. Br. Ind. IV. 673. A. intermedia, Wight in Benth. Lab. Gen. & Sp. 703; DC. Prodr. XII. 456. Nepeta malabarica, Linn. Mant. 566. Ajuga fruticosa, Roxb. Fl. Ind. III. 1.

PENANG: Wallich 2037! Ayer Etam, Tat's Corner, Curtis 3741!—DISTRIB. Drier parts of India and Ceylon; Mauritius, where it is probably an introduced species.

The fact that this plant is in our area confined, so far as is known, to Penang, makes it not improbable that we have here to deal with an introduced species. It is a common and characteristic plant of the Deccan and of the drier region of Ceylon, but does not occur elsewhere in India.

13. LEONOTIS, R. Br.

Herbs or shrubs, usually tall and coarse. Flowers large, in many-flowered axillary whorls; bracts numerous, slender. Calyx 10-nerved; tube often incurved; mouth oblique, with 8 to 10 rigid teeth, the uppermost longer than the rest. Corolla-tube included or exserted; lower lip small, 3-lobed, the mid-lobe largest; upper lip long, concave, villous above. Stamens 4, didynamous, ascending under upper lip, lower pair longer; anthers connivent; the cells divaricate. Disk equal. Style subulate, with very short upper lobe. Nutlets obovoid or oblong or ovoid, truncate or rounded at the apex, glabrous.—Distrib. Species about 12, mostly confined to Africa, the present one occurring also in Asia and America, where probably it was originally introduced.

LEONOTIS NEPETIFOLIA, R. Br. in Ait. Hort. Kew. ed. 2, III. 409 (1811). A tall erect annual herb, 4 to 7 ft. high, with stout obtusely thickly 4-angled stems deeply furrowed between the angles, finely pubescent. Leaves opposite, membranous, ovate-acute; base shortly cuneate and decurrent on the petiole, entire; margin elsewhere coarsely crenate-serrate, finely pubescent above and below, 2.5 to 6 in. long, 1.5 to 4 in. wide; petiole 1 to 4 in. long, winged near apex. Flowers in dense globose, axillary, many-flowered whorls 1.5 to 2.5 in. across; floral leaves lanceolate, deflexed; bracts linear, strongly spinescent at the apex, deflexed, pubescent, the longest 5 in. long or longer. Calyx 6 in. (in fruit 75 in.) long, tubular, incurved, strongly ribbed, puberulous below, densely pubescent above, where also hispid with long white hairs, reticulately veined within, glabrous; teeth 8 to 9, unequal, the uppermost 35 in. long, ovate-acute, much exceeding the triangular others, all with spinescent tips. Corolla 1 in. long, orangescarlet; tube 5 in. long, glabrous near base, densely beset above with orange-scarlet pubescence, 3-annulate within with transverse bands of white hairs; lower lip 15 to 2 in. long, with 3 oblong obtuse lobes, the mesial rather the largest; upper lip 5 in. long, densely villous with orange-scarlet hairs. Nutlets 15 in. long, oblong-obovoid, obliquely truncate and pitted at apex. Benth. in Wall. Pl. As. Rar. I. 59, in Lab. Gen. & Sp. 618, and in DC. Prodr. XII. 535; Wall. Cat. 2042; Wight Ill. II. t. 176 B; Wight Ic. t. 867; Bot. Reg. t. 281; Bot. Mag. t. 3700; Mig. Fl. Ind. Bat. II. 984; Hook. f. Fl. Br. Ind. IV. 691. nepetæfolia, Linn. Sp. Pl. 586; Roxb. Fl. Ind. III. 8 (sph. repetifolia).

In some of the provinces, as an escape.—DISTRIB. Tropical Africa, where probably indigenous, but also widespread in South-eastern Asia

and occuring in Tropical America.

14. LEUCAS, R. Br.

Herbs or undershrubs. Flowers medium or small, in dense axillary, usually distant, less often terminal whorls. Calyx 10-nerved, often striate; mouth equal or oblique; teeth 6 to 10, usually unequal. Corolla-tube not exserted, annulate or not within; lower lip 3-fid, spreading, mid-lobe large; upper lip erect, concave, villous externally. Stamens 4, didynamous, the upper pair shorter, ascending under upper lip; anthers connivent; cells divaricate, ultimately confluent. Disk entire or lobed, uniform or enlarged anteriorly. Style subulate; upper lobe minute or obsolete. Nutlets ovoid, triquetrous, obtuse.—Distrib. Species about 100, chiefly in Tropics of Old World.

Whorls numerous, distant, axillary; calyx-teeth long, slender; corolla small; tube not annulate within Whorls few, usually all or nearly all terminal; calyx-teeth short; corolla medium; tube annulate within near the middle:-

1. L. martinicensis.

Whole plant sparingly beset with hispidulous hairs; calyxmouth obliquely campanulate, not contracted; teeth erect .. 2. L. zeylanica. Whole plant smooth, finely puberulous; calyx-mouth projecting above in a large triangular lip, with the small teeth ascending along its margins, the mouth below forming a rounded sinus ...

.. 3. L. lavandulifolia.

1. Leucas martinicensis, R. Br. Prodr. 504 (1810). A tall, stout, annual herb, 2 to 4 ft. high, more or less branched. Stem and branches hirsute, 4-angled and 4-grooved, angles rounded. Leaves opposite, membranous, hirsute above and below, ovate, oblong or wide-lanceolate, obtuse; base cuneate, rarely rounded, entire; margin elsewhere widely and rather deeply crenate; 2.5 to 3.5 in. long, 1 to 1.75 in. wide; petiole hirsute, 4 to 7 in. long. Flowers sessile, in numerous, distant, axillary, globose, many-flowered whorls which are 75 to 1.25 in across. the floral leaves decreasing upwards, especially in width of blade and length of petiole; bracteoles green, 25 to 35 in. long, narrowly linearlanceolate or subulate, spinescent at their tips with pale slender awns. Calyx ·4 in. (in fruit ·6 in.) long, tubular, sigmoid, pubescent externally; tube within glabrous and closely reticulate; mouth with a few short villi within, oblique; teeth 10, all lanceolate, ciliate, with fine spinescent tips; the uppermost largest, 2 in. long; the others alternately longer and shorter, 1 and 12 in. long. Corolla white, small, 35 in. long; tube 2 in long, not annulate within; lower lip spreading, the lateral lobes oblong rounded, wider than the oblong 2-fid central; upper lip erect, white-villous. Nutlets 1 in. long, obovoid-oblong, obliquely truncate at apex, angular on inner face, rounded on outer, dark-brown. shining. Benth. in Wall. Pl. As. Rar. I. 60, in Lab. Gen. & Sp. 617, and in DC. Prodr. XII. 533; Miq. Fl. Ind. Bat. II. 983; Hook. f. Fl. Br. Ind. IV. 688. L. polycephala, Wall. Cat. 2051. Phlomis martinicensis, Sw. Prodr. Veg. Ind. Occ. 88.

Perak: in waste places, Scortechini!—Distrib. Tropical America: Tropical and South Africa; India and Indo-China.

An introduced and as yet apparently a rare plant in our area.

2. Leucas Zeylanica, R. Br. Prodr. 504 (1810). An erect annual herb, 6 to 20 in. in height, simple or branched. Stems and branches 4-angled, hispidulous with scattered spreading hairs. Leaves opposite, decussate, membranous, dark-green above, uniformly but sparsely beset

with spreading hispidulous hairs, paler and subglaucescent beneath, with spreading hispidulous hairs on the nerves, the hairs on both sides curved towards leaf-apex, ovate-lanceolate, or occasionally lanceolate, acute: base long-cuneate, entire: margin elsewhere entire or remotely and sparingly serrate; 1.5 to 3 in. long, 25 to 5, rarely 75 in. wide; petiole 1 to 2 in, long, hispidulous. Flowers sessile or subsessile, in terminal usually 6- to 8-leaved whorls 5 to 75 in, across, occasionally also axillary whorls occur below; bracts 25 in. long, linear, spinescent, hispidulous along the margin with stiff spreading hairs. Calva 2 in. (in fruit ·3 in.) long, turbinate, slightly curved: the tube below glabrous or faintly pubescent externally, above beset with scattered, spreading, hispidulous hairs: the mouth subcampanulate, oblique, distinctly transversely veined between the 10 nerves, and sparingly pubescent within with short white hairs, the uppermost of which project beyond the limb; teeth 8, the uppermost 05 in, long, slightly longer than the others, all subulate, spinescent at the tip. Corolla white, medium, ·5 in, long; tube ·25 in, long, glabrous below, enlarged upwards where pubescent externally, annulate within near the middle; lower lip patent, the mid-lobe large, shortly widely clawed, the lateral lobes small; upper lip obovate, white-woolly. Nutlets 15 in. long, obovoid-oblong; apex subtruncate; inner face angular, outer rounded; dark-brown or black, shining. Benth. in Wall. Pl. As. Rar. I. 60, in Lab. Gen. & Sp. 614, and in DC. Prodr. XII. 531; Wight Ill. t. 176; Hook. f. Fl. Br. Ind. IV. 689. L. involucrata, Benth. in Wall. Cat. 2047. L. dimidiata, Benth. in DC. Prodr. XII. 532 (probably not of Spreng. Syst. II. 743). L. nutans, Benth. in Wall. Pl. As. Rar. I. 60 (not of Spreng.); Wall. Cat. 2523 (not of Spreng.). L. malayana, Hance in Walp. Ann. III. 269. L. bancana, Mig. Fl. Ind. Bat. Suppl. 572; Hallier f. Ann. Jard. Bot. Buitenz, XIII. 293. L. aspera, Hook. f. Fl. Br. Ind. IV. 690 (in part; not of Spreng.). Phlomis zeylanica, Linn. Sp. Pl. ed. 2, 820. Leonurus Marrubiastrum, Burm. Fl. Ind. 127 (not of Linn.).

- SINGAPORE: in waste places, frequent, G. Thomson! Kurz 2906! Deschamps! MALACCA: Griffith! DISTRIB. Throughout Southeastern Asia.
- 3. Leucas lavandulifolia, Smith in Rees Cyclop. XX. n. 2 (1819). An erect, slender, annual herb, 1 to 2 ft. high, usually branching. Stems and branches 4-angled, finely adpressed-puberulous. Leaves opposite, herbaceous, finely puberulous on both surfaces, rather pale-green, linear-lanceolate, less often lanceolate, subacute; base tapering gradually from about the middle, entire; margin elsewhere entire in linear-lanceolate leaves, sometimes remotely and sparingly serrate in lanceolate ones; petiole usually very short or obsolete, rarely as much as 35 in. long.

Flowers subsessile or shortly pedicelled, in axillary and terminal but always leafy whorls, and always towards apex of stem and branches, 4 to 6 in. across; bracts 2 to 3 in. long, narrowly linear, subspinescent, finely puberulous. Calyx 35 in. (in fruit 45 in.) long behind, 2 to ·25 in. long in front, sparingly puberulous or glabrous externally; tube curved: mouth pubescent within with adpressed white short hairs, contracted, very oblique, rounded below, and forming above a large acute lobe much produced forward and tipped by a minute spinescent tooth; the remaining teeth variable in number, also minute, distant, erect along the oblique margin, usually 3, occasionally 4, sometimes only 2 on each side, with often a small tooth in the centre of the rounded sinus opposite the acute posterior lobe. Corolla white, medium, 5 in. long; tube 25 in. long, annulate within near the middle; lower lip patent, the mid-lobe large, obovate, rounded, lateral lobes small; upper lip oblong, white-woolly. Nutlets 12 in. long, oblong, rounded at apex; inner face angular, outer rounded; pale-brown, dull. L. linifolia, Spreng. Syst. II. 743 (1825); Wall. Cat. 2048; Benth. in Wall. Pl. As. Rar. I. 60, in Lab. Gen. & Sp. 617, and in DC. Prodr. XII. 533; Miq. Fl. Ind. Bat. II. 983; Hook. f. Fl. Br. Ind. IV. 690. Phlomis linifolia, Roth Nov. Sp. 260 (1821). P. zeylanica, Roxb. Fl. Ind. III. 9; Jacq. Ic. Pl. Rar. I. 11, t. 111 (not of Linn.). Leonurus indicus, Burm. Fl. Ind. 127. Herba admirationis, Rumph. Herb. Amboin. VI. t. 16, f. 1.

Penang: Penara Bukit, Curtis 1115! SINGAPORE: in cultivated ground, G. Thomson! Kunstler 48!—DISTRIB. South-eastern Asia generally; Mascarenes (Madagascar, Mauritius, Réunion, Seychelles).

The calyx-mouth of this species has been described in works of much authority as glabrous within; it is pubescent within.

15. Leonurus, Linn.

Stout, erect, leafy herbs, with lobed leaves. Flowers small, in densely congested, axillary distant whorls. Calyx turbinate, 5-nerved, with 5 spreading spinescent teeth. Corolla-tube naked or annulate within; lower lip 3-fid, with obcordate mid-lobe; upper lip entire, erect. Stamens 4, didynamous, ascending under upper lip, lower pair longer; anthers connivent; the cells parallel, transverse. Disk uniform. Style equaly 2-fid; the lobes obtuse or subulate. Nutlets smooth, dry, truncate at the apex.—Distrib. Species 10; almost cosmopolitan.

Leonurus sibiricus, Linn. Sp. Pl. 584 (1753). A rather coarse annual herb, with obtusely 4-angled, furrowed, usually softly pubescent stems, 2 to 6 ft. high. Leaves opposite, herbaceous, palmatipartite, with linear incised segments, dark-green and glabrous or nearly so

above, paler and more or less pubescent on the nerves beneath; 1.5 to 4 in. long, 1 to 3 in. wide; petiole 1 to 2 in. long. Flowers in axillary whorls; the upper floral leaves usually entire; bracts .5 in. long, spinescent. Calyx .25 in. (in fruit .35 in.) long, glabrous or sparingly pubescent; tube .2 in. long; teeth spinescent from a shortly triangular base. Corolla .4 to .5 in. long, red; tube .25 in. long, annulate within; lower lip 3-lobed, mid-lobe obcordate, the lateral lobes rounded; upper lip obovate, galeate, entire, pubescent. Filaments exserted. Nutlets .1 in. long, triquetrous, truncate. Wall. Cat. 2071; Benth. in DC. Prodr. XII. 501; Miq. Fl. Ind. Bat. II. 978; Hook. f. Fl. Br. Ind. IV. 678. L. tataricus, Burm. Fl. Ind. 127; Roxb. Fl. Ind. III. 8 (not of Linn.)

In some of the provinces, in waste places; an introduced weed of waysides and waste places.—Distrib. Originally Asiatic, now almost cosmopolitan.

Though described by Bentham, and by Hooker, U.cc., as not annulate, the corolla-tube of this species is distinctly annulate within. The annulus is slightly oblique, rather higher anteriorly, and is slightly imperfect, there being a small hiatus behind where the style comes in contact with the corolla-tube.

16. PARAPHLOMIS, Prain.

Herbs or shrubs. Leaves membranous. Flowers medium, yellow or whitish, in dense axillary, many-flowered whorls; bracteoles numerous, filiform. Calyx 10-nerved, equally 5-toothed; tube slightly incurved. Corolla-tube annulate within; upper lip erect, pubescent externally, quite glabrous within; lower lip spreading, 3-lobed. Stamens 4, ascending under upper lip, lower pair longer; all filaments without basal appendages; anthers connivent; cells divaricate. Disk uniform, entire. Style 2-fid, lobes subequal or the upper shorter than lower. Nutlets obovoid, triquetrous below, rounded above, glabrous.—Distrib. Species 3; two Malayan, one extending from the Eastern Himalaya to the Philippines.

Paraphlomis rugosa, Prain in Ann. Roy. Bot. Gard. Calc. IX. i. 60 (1901). A coarse shrubby plant, 2 to 3 ft. high. Stems stout or slender, minutely hirsute with deflexed hairs. Leaves opposite, membranous, dark-green above, paler beheath, glabrous or with minute scattered hairs on the upper surface, elliptic or oblong-ovate, acuminate; base cuneate or truncate, entire; margin elsewhere shortly toothed, 6 to 8 in. long, 3 to 4 in. wide; petiole slender, 2 to 4 in. long. Flowers in small distant or rather approximate whorls, axillary and

also often many on the stem below the leaves, 75 to 1.25 in. across; bracteoles filiform, glabrescent, rather shorter than the calyx, 3 in. long. Calyx 4 in. (in fruit 5 in.) long, obconic-campanulate; tube slightly curved forwards, glabrous upwards where thickly membranous, usually hispid towards the coriaceous base; teeth 5, slender, lanceolate, from a triangular membranous base, two-thirds the length of the tube, glabrous. Corolla pale-yellow or white, 1 in. long, with a distinct annulus within; both lips pubescent externally; lower 3-lobed with oblong mid-lobe and lanceolate lateral lobes; upper narrow, rounded at apex, half the length of the tube, glabrous within. Filaments all devoid of basal appendages. Style-arms subequal. Nutlets 25 in. long, obovoid, acute below and triquetrous, rounded above, glabrous. Phlomis rugosa, Benth. in Wall. Cat. 2067, in Wall. Pl. As. Rar. I. 63, in Lab. Gen. & Sp. 634, and in DC. Prodr. XII. 545; Hook. f. Fl. Br. Ind. IV. 693; Prain Ann. Roy. Bot. Gard. Calc. III. 231; IX. i. 60. Gomphostemma membranifolium, Miq. Fl. Ind. Bat. II. 988.

Perak: Kinta, on limestone rocks, King's Collector (Kunstler) 7095! Scortechini!—Distrib. Eastern Himalaya; Indo-China; Malay Archipelago; Philippines.

The specific name applied to this plant by Mr. Bentham is, as Sir Joseph Hooker remarks, wholly inapplicable. Its characters are so different from those of the genus *Phlomis*, and its habit so unlike that of any member of that genus, that it is necessary to consider it the type of a distinct genus.

17. Gomphostemma, Wall.

Coarse, stellately pubescent or tomentose perennial herbs or shrubs. Roots sometimes tuberous. Flowers large or medium, in 6- to 24-flowered whorls, sessile and densely or peduncled and laxly cymose; bracteoles lanceolate or linear. Calyx campanulate, 10-nerved, subequally 5-toothed. Corolla-tube slender; throat inflated; limb 2-lipped; lower lip spreading, broadly 3-lobed; upper lip galeate, entire or emarginate. Stamens 4, pubescent, the lower longer, all ascending; anthers connivent in pairs, 2-locular; cells transverse, parallel. Disk subequal or gibbous behind. Style 2-fid; the lobes subulate, the anterior slightly the longer. Nutlets drupaceous, glabrous or pubescent, the pericarp usually fleshy and white, with a broad hilum; rarely all developed.—DISTRIB. Species 26, South-eastern Asiatic.

Corolla with almost straight tube and narrow throat; calyxtube hispidly hairy within; ovary glabrous; nutlets solitary, glabrous (§ STENOSTOMA):—

Calyx-teeth triangular, much shorter than the tube; whorls few-flowered, densely congested; flowers yellow ... 1. G. microcalyx. Calyx-teeth linear-subulate, longer than the tube; whorls many-flowered, laxly cymose; flowers yellow 2. G. crinitum. Corolla with distinctly incurved tube and wide-campanulate throat; nutlets 4 (§ Eugomphostemma):-Calyx-tube hirsute within, ribbed, green; ovary villous; nutlets hispid at apex :-Corolla yellow; style hirsute; calyx-teeth longer than 3. G. Scortechinii. Corolla white; style usually glabrous; calyx-teeth not longer than tube 4. G. oblongum. Calyx-tube glabrous within, not ribbed, reddish; corolla white; nutlets quite glabrous, punctulate 5. G. Curtisii.

- Sect. 1. Stenostoma, Prain. Corolla-tube straight, glabrous within, longer than the calyx, the limb narrow, the lips small. Nutlets usually solitary, smooth.
- 1. Gomphostemma microcalyx, Prain Journ. As. Soc. Beng. LIX. ii. 316 (1890). A coarse perennial herb, 3 to 5 ft. high. Stems stout, erect, sulcate, woody, hoary-pubescent or scabrid. Leaves opposite, herbaceous, dark-green above, hoary beneath, finely closely stellate-pubescent on both surfaces, oblong-ovate, acute; base cuneate, entire; margin elsewhere entire or widely and minutely toothed; 4.5 to 6 in. long, 3 to 3.5 in. wide; petiole of lower leaves 1.5 to 2 in., of upper leaves .5 in. long, scabrid. Flowers in dense, few-flowered whorls in the axils of the lower leaves and on the bare stem below the leaves; bracts ovate-lanceolate, entire, .25 in. long, .12 in. wide. Calyx .3 in. long; teeth short, triangular, less than half as long as the tube. Corolla yellow, 1.25 in. long, slightly puberulous externally; the throat very narrow. Style and ovary glabrous. Nutlets smooth, glabrous. Ann. Roy, Bot. Gard. Calc. III. 251.

Perak: Larút, 1800 to 2000 ft. elev., King's Collector (Kunstler) 2155! Scortechini 842! Wray 835! Ulu Bubong, King's Collector 10455!

Nearest to G. parviflorum, Wall., but with a much smaller calyx with diminutive teeth and a much narrower corolla. G. parviflorum, though stated by Bentham, Miquel, and Hooker to occur in Penang, has never been met with in our area. The specimens on which the statement is based were collected by Wallich, who in 1828 issued them as the types (Lith. Cat. n. 2159-1) of his own species G. crinitum, to which they most undoubtedly belong. A year later Wallich referred these same specimens (as n. 2158-c) to his own G. parviflorum; this quite erroneous afterthought has been accepted by the three authors referred to.

2. Gomphostemma crinitum, Wall. Cat. 2159 (1828). A coarse perennial herb, 3 to 4 ft. high. Stems stout, erect, sulcate, woody,

hoary-pubescent or scabrid. Leaves opposite, herbaceous, dark-green, pubescent above, hoary beneath with a close stellate tomentum, or softly pubescent, elliptic-ovate or oblanceolate, acute; base cuneate, entire; margin elsewhere entire or serrate; 8 to 12 in. long, 2·5 to 5 in. wide; petiole ·5 to 1·5 in. long, scabrid. Flowers in rather lax, rarely condensed, many-flowered axillary cymes; bracts lanceolate, ovatelanceolate or linear, ·5 to ·75 in. long. Calyx ·7 to ·75 in. long; teeth long, linear-subulate, considerably longer than the tube. Corolla yellow, 1·25 in. long, slightly puberulous externally; the throat narrow. Style and ovary glabrous. Nutlets smooth, glabrous.

Var. typica. Bracts all lanceolate-acute or linear, almost as long as the calyx; leaves closely tomentose beneath; petioles 1·5 in. long. G. crinitum, Wall. Cat. (uti supra); Benth. in Wall. Pl. As. Rar. II. 12, in Lab. Gen. & Sp. 648, and in DC. Prodr. XII. 552; Miq. Fl. Ind. Bat. II. 987; Hook. f. Fl. Br. Ind. IV. 698 (partly); Prain Ann. Roy. Bot. Gard. Calc. III. 254. G. parviflorum, Benth. Lab. Gen. & Sp. 648, and in DC. Prodr. XII. 551; Miq. Fl. Ind. Bat. II. 987 (not of Wall.).

Penang: Wallich 2159/1! Perak: Kampong Kota, Wray! Sungei Ujong, Ridley 1870!—Distrib. Indo-China.

Var. Griffithii, Prain Ann. Roy. Bot. Gard. Calc. III. 254. Outer bracts ovate-lanceolate obtuse, distinctly shorter than the calyx; leaves softly pubescent beneath; petioles 5 in. long.

Malacca: Mount Ophir and Chabu, Griffith 4042! Perak: Gunong Ijok, Scortechini 5! Ulu Kwangsa, Scortechini 928!

- Sect 2. Eugomphostemma, Prain. Corolla-tube incurved, glabrous within, longer than the calyx, the limb campanulate, the lips large. Nutlets usually 4, smooth or punctulate.
- 3. Gomphostemma Scortechini, Prain Journ. As. Soc. Beng. LIX. ii. 315 (1890). A coarse perennial herb, 3 to 5 ft. high. Stems stout, erect, sulcate, woody, scabrid. Leaves opposite, herbaceous, darkgreen, sparsely hirsute above, closely tomentose on the nerves, otherwise sparsely tomentose beneath, elliptic-oblong or obovate, acute; base rather long-cuneate; margin entire or serrate; 6 to 12 in. long, 3 to 6.5 in. wide; petiole usually short, sometimes obsolete, occasionally as much as 1 in. long. Flowers in many-flowered rather dense axillary whorls; bracts subulate, 2 in. long, as long as the pedicels. Calyx .75 in. long, prominently ribbed, hirsute within; teeth lanceolate, longer than the tube. Corolla yellow, 2.25 in. long, distinctly incurved, tomentose externally; limb .35 in. wide. Style hirsute towards the apex, with spreading hairs; ovary densely villous. Nutlets white,

smooth, hispid towards the apex. Ann. Roy. Bot. Gard. Calc. III. 260.

PERAK: Gunong Tujok, Scortechini!; Larút, Kunstler 1959!—DISTRIB. Indo-China.

Very closely related to G. oblongum, Wall., of which it appears to be the representative in the Malayan Peninsula. It extends northwards to Tenasserim, and its area thus to some extent overlaps that of G. oblongum.

4. Gomphostemma oblongum, Wall. Cat. 2154 (1828). A coarse perennial herb, 3 to 5 ft. high. Stems stout, erect, woody, somewhat 4-angled, densely tomentose. Leaves opposite, herbaceous, dark-green, hispidly hairy above, densely pubescent beneath, elliptic-oblong, acute; base rather abruptly cuneate or subtruncate; margin crenate or crenateserrate; 6 to 12 in. long, 2 to 3.5 in. wide; petiole 35 to 1 in. long, densely tomentose. Flowers in rather dense few-flowered axillary whorls; bracts ovate-lanceolate, 25 in. long. Calyx 5 in. long, prominently ribbed, hirsute within; teeth lanceolate, not longer than the tube. Corolla white, 1.75 in. long, distinctly incurved, tomentose externally except on the mid-lobe of the lower lip; limb 35 in. wide. Style glabrous or, when young, sparingly hirsute; ovary villous. Nutlets white, smooth, hispid at the apex. Benth. in Wall. Pl. As. Rar. II. 12, in Lab. Gen. & Sp. 648, and in DC. Prodr. XII. 551 (partly); Miq. Fl. Ind. Bat. II. 986 (partly); Hook. f. Fl. Br. Ind. IV. 697; Prain Ann. Roy. Bot. Gard. Calc. III. 261.

Andamans: Port Blair, not uncommon.—Distrib. Indo-China.

This species is very closely related to *G. Scortechinii*, from which it differs mainly in its rather smaller white flowers and its less hirsute or quite glabrous style. It has not yet been collected in any of the Malayan provinces, but having regard to the fact that *G. Scortechinii* extends northwards to Tenasserim, where *G. oblongum* is common, and thus invades the area in which *G. oblongum* occurs, it is not impossible that this species may yet be met with in the northern part of the Malayan Peninsula; it seems therefore advisable to give it a place in these *Materials*.

5. Gomphostemma Curtish, Prain Journ. As. Soc. Beng. LIX. ii. 315 (1890). A coarse perennial herb, 3 to 4 ft. high. Stems rather weak, flexuous, ascending, scabrid. Leaves opposite, the pairs rather remote, herbaceous, dark-green, hirsute above, adpressed-tomentose beneath, oblong-ovate, acute; base very shortly cuneate; margin denticulate; 3 to 5 in. long, 2 to 2.75 in. wide; petiole 1.25 to 4.5 in. long, adpressed-tomentose. Flowers in many-flowered lax axillary cymes; bracts narrow-ovate, long-acuminate, entire, reddish, 4 to 6 in. long. Calyx. 5 in. long, smooth, glabrous within, reddish; teeth lanceolate-subulate from a short wide base, longer than the tube. Corolla white, 1 in. long, distinctly incurved, puberulous externally; limb. 3 in.

wide. Style glabrous; ovary glabrous. Nutlets white, glabrous, punctulate. Ann. Roy. Bot. Gard. Calc. III. 266.

Penang: Curtis 1310! Perak: Larút, Scortechini 924! Wray 1233!

18. CYMARIA, Benth.

Shrubs. Flowers small, in lax, many-flowered, peduncled, raceme-like cymes, all axillary, or the upper ones forming a terminal thyrsoid panicle. Calyx erect, 10-nerved, the intermediate nerves weaker than the other 5, equally 5-toothed; the tube in fruit urceolate; the throat within naked or with a few setose hairs. Corolla-tube straight, exserted; limb 2-lipped; lower lip 3-lobed, spreading, the mid-lobe larger than the lateral; upper lip arched, erect. Stamens 4, ascending under the upper lip, didynamous, the upper pair shorter; anthers connivent, the cells divaricate. Disk equal, entire. Style-arms unequal, the upper very short. Nutlets subglobose or obovoid, rugosely pitted; hilum very large, lateral.—Distrib. Species 3, in Indo-China and Malaya.

CYMARIA DICHOTOMA, Benth. in Wall. Cat. 2080 (1828). A shrub, 2 to 3 ft. high. Stems and branches faintly 4-angled, finely pubescent. Leaves opposite, membranous, dark-green and almost glabrous except on the pubescent nerves above, paler, glandular, and closely grevpubescent beneath, ovate or rhomboid, acute or subacute, rarely acuminate; base cuneate, decurrent on the petiole, entire; margin elsewhere distinctly to faintly crenate or sometimes subentire; 1.5 to 4 in. long, 1 to 2.25 in. wide; petiole .25 to .75, rarely 1 in. long, finely pubescent. Flowers in once, or sometimes twice, dichotomously branching cymes with terminal flowers and 6 to 12 secundly arranged flowers on each branch; the main peduncles 5 to 1 in. long, finely pubescent; the flower-bearing branches 6 to 1.5 in. long; bracts under branches spathulate-acute to lanceolate, 1 to 2 in. long; bracteoles subulate, ·05 in. long, finely pubescent. Calyx in flower campanulate, ·08 in. long, in fruit urceolate, 15 in. long, glandular and pubescent, especially on the nerves externally, within sparingly beset with white setose hairs above the constriction; teeth 5, equal, triangular, as long as the portion of tube above the constriction; pedicels slender, finely pubescent, 05 in. long. Corolla yellow, 16 in. long, uniformly finely pubescent externally; tube distinctly exserted; lower lip spreading, 3-lobed, mid-lobe wide-oblong; upper lip erect, oblong; the apex notched. Filaments ascending under upper lip, included. Nutlets obovoid, 03 in. long, wide-reticulate on back, the upper third glandular; the apex beset with very short white hairs. Benth. in Wall. Pl. As. Rar. I. 64, in Lab. Gen. & Sp. 705, and in DC. Prodr. XII. 603; Mig. Fl. Ind. Bat. II. 992; Hook. f, Fl. Br. Ind. IV. 705; Prain Journ. As. Soc. Beng. LXVI. ii. 522.

Perak: on limestone hills, Scortechini! Ipoh Quarries, Ridley 9734! Marble Hill, Ipoh, Fox (Ridley 10686)!—DISTRIB. Burma.

The Perak specimens have rather more numerously flowered cymes than those from Burma, but are in other respects indistinguishable.

Family XCII. PLANTAGINACEÆ.

[By D. Prain.]

Annual or perennial scapigerous herbs. Leaves usually radical; scapes axillary. Flowers small, greenish, bracteate, often dimorphic, spicate. Sepals 4, imbricate in bud, persistent. Corolla scarious, hypogynous; lobes 4, short, imbricate in bud. Stamens 4, inserted on the corolla-tube or hypogynous; filaments filiform, persistent; anthers large, pendulous, versatile. Ovary superior, 1- to 4-celled; ovules in each cell 1 to 8. Capsule 1- to 4-celled, membranous: dehiscence circumscissile. Seeds 1 or more, usually attached by the centre; testa thin, mucilaginous; albumen fleshy; embryo cylindric, transverse; radicle inferior.—Distrib. Species under 100; cosmopolitan.

PLANTAGO, Linn.

Annual or perennial herbs with a dense rosette of radical leaves. Flowers small, greenish, in dense spikes. Sepals 4, free, imbricate, persisting. Corolla 4-lobed, scarious; lobes short, imbricate. Stamens 4, adnate to corolla-tube; filaments filiform; anthers 2-celled, versatile. Ovary superior, 2- to 4-celled; ovules one or more in each cell. Fruit a small membranous capsule; dehiscence circumscissile. Seeds peltate, albuminous, mucilaginous.—Distrib. Species under 100, mainly in temperate regions.

Plantago major, Linn. Sp. Pl. 112 (1753). A perennial herb with an erect stout rhizome. Leaves alternate, spirally disposed, all radical, sometimes sparsely pubescent, sometimes nearly glabrous on both sides, ovate or ovate-oblong, obtuse or subacute; base long-cuneate, tapering to and decurrent on the petiole; margin often irregularly and somewhat abruptly toothed; 3- to 7-, usually 5-nerved; 1 to 5 in. long, very variable in width; petiole often longer than the leaf-blade, broad and sheathing at the base. Flowers crowded or dispersed in slender rather lax spikes 2 to 6 in. long; bracts '05 to '08 in. long, broadly ovate-oblong, obtuse, with scarious margins. Calyx '12 in. long, glabrous; sepals oblong, obtuse or subacute, bluntly keeled externally,

margins widely scarious. Corolla ·18 in. long, glabrous; lobes lanceo-late-acute, reflexed. Capsules ovoid, ·12 to ·15 in. long, glabrous, dehiseing horizontally a little above the base, the upper portion separating as a conical lid tipped by the remains of the style. Seeds 4 to 8, angular, rugulose, dull, blackish, length ·03 in. Dene. in DC. Prodr. XII. 696; Miq. Fl. Ind. Bat. II. 709; Hook. f. Fl. Br. Ind. IV. 705. P. asiatica, Linn. Sp. Pl. 163; Wall. Cat. 6412; Wall. in Roxb. Fl. Ind. ed. Carey & Wall. I. 423.

SINGAPORE: Hullett; Kurz. Penang: Walker. Malacca: Griffith.—Distrib. Almost cosmopolitan. In our area doubtless an introduced plant.

ERRATA.

P. 642, line 20, for "4. CARDANTHERA, Voigt.," read "4. CARDANTHERA, Ham. MS." Line 7 from bottom, for "CARDANTHERA TRIFLORA, Voigt," read "CARDANTHERA TRIFLORA, Ham. MS. in Voigt."

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ASIATIC SOCIETY OF BENGAL.

Vol. LXXIV., Part II.—Extra Number, 1908.

Materials for a Flora of the Malayan Peninsula.—By Sir George King, K.C.I.E., LL.D., F.R.S., late Superintendent of the Royal Botanic Garden, Calcutta, and J. Sykes Gamble, C.I.E., F.R.S., late of the Indian Forest Department.

No. 21.

This Part contains two Families, No. 86 Gesneracea and No. 90 Verbenaceæ, and completes the account of the Gamopetalæ. account of the Gesneraceæ was prepared by Mr. H. N. Ridley, F.R.S., Director of the Botanic Garden at Singapore, and was published in the 'Journal of the Straits Branch of the Royal Asiatic Society for 1905.' The material used by him was that of the Herbaria of Singapore and Penang, together with that belonging to the Royal Botanic Garden of Calcutta, and chiefly got together by collectors employed by Sir George King, lent to Mr. Ridley for the purpose. The account in the 'Straits Journal' not being quite in the form used in the 'Materials,' published under the auspices of the Asiatic Society of Bengal, has been edited by Mr. Gamble, with the kind help of Lt.-Col. Prain, of Kew, but he has been careful to make no more formal alterations than could be helped; so that the work is one for which Mr. Ridley alone is responsible. Only numbers personally verified or quoted by Mr. Ridley have been entered under the different species. Mr. Ridley, who has sanctioned what has been done, has himself furnished a few notes and additions, among them being descriptions of 3 new species, one of them the representative of a new genus. The number of species of Gesneracea herein described is 131, belonging to 20 genera, 1 genus and 2 species being new, besides 1 Sumatran species newly described.

The Verbenaceæ have been done by Mr. Gamble. It comprises 15 genera and 72 species, of which 16 species are new to science. Two Malay Islands species are also described.

In accordance with the Rules adopted at the Vienna Conference, Latin diagnoses are appended to the new genus and the 3 new species of *Gesneracea*, those for *Verbenacea* have been published in the Kew Bulletin.

Family LXXXVI.—GESNERACEÆ.

Herbs or shrubs, usually pubescent. Leaves opposite or apparently alternate, one of each pair being much reduced, simple entire or lobed. Inflorescence axillary, cymose or racemose or panicled; bracts small or large. Calyx of 5 sepals, often connate. Corolla tubular or campanulate, more or less distinctly bilabiate, 5-lobed; lobes oblong or rounded. Stamens 4 or 2, rudimentary or absent, didynamous when four; filaments linear or filiform, or short and thick; anthers linear or oblong, or scutiform, connivent in pairs, 2-celled; cells splitting on the inner face. Disk cylindric or annular or absent. Ovary cylindric or oblong; style slender, simple; stigma capitate, cordate or bilobed. Fruit a capsule, linear, cylindric, fusiform or oblong, splitting dorsally. Seeds very numerous, minute, plumed in epiphytic species, elliptic and not plumed in terrestrial species; or a fleshy berry (Cyrtandra).—Distrib. Species about 600, all tropical with a few in subtropical climates.

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Seeds with one or more hairs from near hilum, and a single
hair from apex; fruit dehiscent, a cylindric capsule :-
  Stamens 4 perfect
                                                                1. ÆSCHYNANTHUS.
  Stamens 2 perfect
                                                                2. AGALMYLA.
Seeds without hairs :-
  Fruit dehiscent, a capsule, follicle or pyxidium :-
    Capsules or follicles cylindric or rarely (Loxocarpus)
    conic: -
      Corolla funnel-shaped :-
        Stamens 4
                                                               3. DIDISSANDRA.
        Stamens 2:-
          Capsule linear.
            Stigma entire, ovate or capitate
                                                               4. DIDYMOCARPUS.
            Stigma 2-fid ...
                                                                5. CHIRITA.
          Capsule lanceolate or ovate
                                                                6. Tetraphyllum.
      Corolla shortly campanulate :-
        Stamens 2:-
          Fruit a conic follicle
                                                               7. LOXOCARPUS.
          Fruit a cylindric capsule :-
            Capsule straight
                                                               8. PARABOEA.
            Capsule twisted :-
              Calyx 5-lobed
                                                               9. BOEA.
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Calyx 3-lobed		10.	PHYLLOBOEA.
Stamens 4		11.	BOEICA.
Capsules or pyxidia ovoid or ellipsoid :-			
Stamens 2:—			
Sepals free to the base :			
Stem very short; calyx-lobes linear		12.	ORCHADOCARPA.
Stem elongate; calyx-lobes ovate	••	13.	LEPADANTHUS.
Sepals connate half-way up in a campanulat	e calyx	14.	RHYNCOGLOSSUM.
Stamens 4:—			
Fruit with dehiscence circumscissile		15.	Ерітнема.
Fruit splitting irregularly:-			
Herbs:—			
Leaf solitary; flowers minute	••	16.	Monophyllaeá.
Leaves several alternate; flowers large		17.	STAURANTHERA.
Shrubs leafy:—			
Sepals free to the base; flowers small		18.	Внукснотесним.
Sepals connate in a tubular shortly lobe	ed calvx;		
flowers large		19.	CYRTANDROMOEA.
Fruit indehiscent, baccate; stamens 2		20.	CYRTANDRA.

1. ÆSCHYNANTHUS, Jack.

Epiphytes or rock-plants, with slender creeping or erect half-woody stems. Leaves opposite or whorled, fleshy or coriaceous, entire, ovate or lanceolate. Flowers large, usually showy, red yellow or green, in axillary or terminal heads, pedicelled. Bracts ovate or lanceolate, small. Calyx tubular or campanulate, subentire or more or less lobed, or sepals free to the base. Corolla tubular, curved, dilated above, shortly 2-lipped; upper lip of 2 lobes erect; lower of 3 lobes deflexed. Stamens 4 perfect, didynamous, usually exsert; anthers connivent in pairs; loculi oblong, parallel. Ovary superior, with a short cup-shaped disk at the base; style as long as stamens or shorter; stigma dilate or peltate. Capsule long-cylindric; base usually empty and narrower (gynophore), 2-valved loculicidally. Seeds innumerable, minute, oblong, rugose, with one or more hyaline scabrid hairs from near the hilum, and one from the apex.—Distrib. Species about 64, in India, Malaya and Hongkong; chiefly Malayan.

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Corolla-tube 2-3 in, long:-
                                                             5. Æ. longiflora.
      Sepals pubescent
                                                             6. Æ. perakensis.
      Sepals glabrous ...
                                                             7. Æ. Hildebrandii.
    Corolla-tube under 1 in. long ...
Sepals distinctly connate below :-
  Calyx tubular, its mouth distinctly 5-lobed :-
    Stems erect or pendent, not rooting at the nodes:-
      Calyx 1 in. long, lobes under .5 in. long
                                                             8. Æ. rhododendron.
                                                             9. Æ. longicalyx.
      Calyx 1.25 in. long, lobes .5 in. long
    Stems creeping, rooting at the nodes:-
      Leaves glabrous ..
                                                            10. Æ. Lobbiana.
      Leaves pubescent
                                                            11. Æ. radicans.
  Calyx cupular or campanulate, mouth entire or sub-
  entire:-
    Calyx green, cupular
                                                           12. Æ. Wallichii.
    Calvx red, widely obconic
                                                           13. Æ. obconica.
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1. ÆSCHYNANTHUS MOTLEYI, Clarke in DC. Monog. Phan. V. i. 20 (1883). Epiphytic woody plant; branches erect or pendulous, about 12 to 18 in. long. Leaves opposite, fleshy; lanceolate or ovate-lanceolate, acute; margins undulate or not; upper surface light green, lower pink; 3 to 4 in. long, 5 to 1.5 in. broad; petiole 25 in. long. Flowers solitary or few, axillary, pendulous; pedicels 25 in. long or less. Calyx-tube short, 125 in. long; lobes 75 to 1 in. long, glabrous, blackish-red. Corolla-tube 75 to 1.25 in. long, dilated upwards and at the base, light green; lobes rounded, sparingly hairy, the tips of the petals dark purple-brown. Stamens brown; filaments glabrous. Ovary oblong, with 5 glandular patches at base; style very short, cylindric; stigma capitate. Capsule cylindric, narrowed at the tip, 9 to 13 in. long. Seed 06 in. long, oblong, blunt, pustular; plume 5 in. long. Ridley in Journ. Linn. Soc. XXXII. 500, and in Journ. Str. Br. R. As. Soc. No. 43, 12.

PERAK: Larút Hills, Kurau and Batang Padang, Wray 245, 1475; Scortechini; Goping, Kinta, King's Collector 4463. Pahang: Pulau Manis, Pahang River, Ridley 2151. Johore: Batu Pahat, Ridley. SINGAPORE: Chanchu Kang, Ridley 6244.—DISTRIB. Sumatra, Borneo, Celebes, Ceram.

2. ÆSCHYNANTHUS MARMORATA, T. Moore in Paxt. Fl. Gard. III. 56 (1852–53). An epiphyte, with erect woody stems about 12 in. high. Leaves fleshy, lanceolate, acute, narrowed at the base; light green on the upper surface with lighter variegations, dull green with transverse purple bars on the lower; petiole 25 in. long. Flowers solitary or few together, axillary; pedicels slender, 25 in. long. Calyx-tube very short (hardly any); lobes linear, pubescent, 35 to 4 in. long. Corolla-

tube a little over 1 in. long, dilated upwards, curved; lobes rounded, pubescent, green with brown bars in the mouth. Stamens 1.5 in. long; filaments hairy. Style hairy; stigma bilobed. Capsule 6 in. long, rather thick. Seed oblong, pustular; plume 5 in. long. N. E. Brown in Gard. Chron. XVIII. 787 (1882); Clarke in DC. Monog. Phan. V. i. 38: Ridley in Journ. Linn. Soc. XXXII. 500, and in Journ. Str. Br. R. As. Soc. No. 43, 13. Æ. zebrina, Van Houtte Cat. (1851).

Керан: at Gunong Raya, Langkawi Islands, Curtis 2142. Penang: Government Hill, Curtis 1700; Ridley.—Distrib. Burma (Mergui), Siam.

3. ÆSCHYNANTHUS SPECIOSA, Hook. Bot. Mag. t. 4320 (1847). A shrubby plant, with erect rather stout stems about 1 ft. high. Leaves fleshy, in whorls of 4 to 5, lanceolate, acute; margins smooth or undulate; 3 to 6 in. long, '75 to 1.75 in. broad; petiole '125 to '25 in. long. Flowers large, showy, subterminal, clustered 10 or more together; bracts linear-lanceolate, hairy, '25 in. long; pedicels slender, '5 in. long. Calyx-lobes linear, free to the base, pubescent, '5 in. long. Corolla-tube 3 in. long, narrow-cylindric at base, enlarged and curved above; lobes rounded, all pubescent. Stamens '5 in. long, longer than the corolla-tube; filaments slender, slightly pubescent. Style stout, pubescent. Paxt. Mag. XIV. 199; Fl. des Serres Ser. I. t. 267; Miq. Fl. Ind. Bat. II. 718; Clarke in DC. Monog. Phan. V. i. 33; Ridley in Journ. Linn. Soc. XXXII. 499, and in Journ. Str. Br. R. As. Soc. No. 43, 14.

PERAK: Bruseh, near Bidor, W. G. Napier. Selangon: Bukit Hitam, Kelsall; Tomoh, Machado.—Distrib. Java, Sumatra (Forbes 2526), Borneo.

4. ÆSCHYNANTHUS STENOPHYLLA, Ridley, n. sp. Stem slender, 1 to 2 ft. long; internodes '5 in. long. Leaves fleshy, glabrous, crowded towards the top of the stems; linear lanceolate, subacute, slighly narrowed at base; 2 in. long, '25 in. broad. Flowers solitary in the axils of the leaves; pedicels very short, angular, glabrous, '25 in. long. Calyx-lobes linear, acute, glabrous, '125 in. long. Corolla (only one bud seen) small, pubescent. Capsule papery, linear, cylindric, 1 ft. long. Disk annular. Seeds with a single long white hair '75 in. long.

PERAK: at Goping Kinta, at 500 to 800 ft. elevation, found growing on the hollow branch of a large tree, *King's Collector* 4738.—DISTRIB. Sumatra? (Forbes 2535).

[ÆSCHYNANTHUS STENOPHYLLA, Ridley, n. sp. Caulis gracilis, 30 ad 60 cm. longus, 1 ad 1.5 cm. intra nodos. Folia carnosa, glabra, versus apicem caulis congesta; lineari-lanceolata, subacuta, ad basin attenuata; 5 cm. longa, 6 mm. lata. Flores in axillis foliorum solitarii; pedicelli brevissimi, angulares, glabri, 6 mm. longi. Calycis lobi lineares, acuti, glabri, 3 mm. longi. Corolla parva, pubescens. Capsula chartacea,

linearis, cylindrica, 30 cm. longa; discus annularis. *Semina* pilo unico albo 2 cm. longo munita.

Peninsula Malayana in Prov. Perak, circa 1500 ad 2500 m. alt.]

5. ÆSCHYNANTHUS LONGIFLORA, DC. Prodr. IX. 262 (1845). An erect woody plant, with stem over 1 ft. high. Leaves opposite, in distant pairs, fleshy; ovate, acuminate, shortly narrowed at base; 5 in. long by 2 in. wide; petiole 5 in. long. Flowers several, terminal, in a cluster; pedicels hairy, 5 in. long. Calyx-lobes narrowly linear, 5 in. long, puberulous, free nearly to the base. Corolla-tube scarlet, 3 in. long, cylindric at base, dilated above, hairy; lobes short, rounded. Stamens 75 in. longer than corolla-tube; filaments slender, pubescent. Style rather stout. Capsule cylindric, narrow, over 6 in. long. Hassk. Cat. Hort. Bogor. ed. 2, 154; Hook. Bot. Mag. t. 4328; De Vriese Pl. Ind. Bat. Reinw. 9; Fl. des Serres Ser. 1, t. 288; Paxt. Mag. XV. 25; Miq. Fl. Ind. Bat. II. 717; Clarke in DC. Monog. Phan. V. i. 32; Ridley in Journ. Linn. Soc. XXXII. 499, and in Journ. Str. Br. R. As. Soc. No. 43, 14. Lysionotus longiflora, Bl. Bijdr. 766.

Pahang: on trees along the Tahan River, Ridley 2167.—DISTRIB. Java.

6. ÆSCHYNANTHUS PERAKENSIS, Ridley in Journ. Linn. Soc. XXXII. 449 (1895). A shrubby epiphyte, with stems about 2 ft. long. Leaves coriaceous; lanceolate, acuminate; 3 to 7 in. long, 1 to 2 in. wide; nerves inconspicuous. Flowers in a terminal fascicle, on pedicels nearly 5 in. long; bracts subulate, 125 in. long. Calyx-lobes linear, 25 in. long, glabrous, free to the base. Corolla-tube deep red, 2 to 2.5 in. long, narrow at the base, dilated and curved upwards, nearly glabrous; lobes rounded. Stamens 75 in. longer than corolla-tube; filaments glabrous or sparingly pubescent. Capsule more than 1 ft. long. Seed narrowly oblong, pustular, with a single hair at each end. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 15.

PERAK: in Larút Hills at 5500 ft., Ridley; Curtis 11447; King's Collector 2337, 7022; at Sungei Ryah, King's Collector 3641; at Thaiping, King's Collector 8314.

7. ÆSCHYNANTHUS HILDEBRANDII, Hemsl. in Bot. Mag. t. 7365 (1894). A shrubby epiphyte; branches about 6 in. long, often rooting. Leaves fleshy, in distant pairs, glabrous, sessile; ovate, acute, base rounded; margins ciliate and with distant glands 5 in. long and broad. Flowers few, terminal at the ends of the branches; pedicels 25 in. long. Calyxlobes free to the base, linear, acuminate, pubescent, 15 to 2 in. long. Corolla-tube thick, curved, little dilated, 75 in. long, glabrous, orange in colour; lobes short, red, rounded, pubescent. Stamens shortly exsert,

hairy. Capsule 6 in. long; base narrowed, sterile. Ridley in Journ. Linn. Soc. XXXII. 502, and Journ. Str. Br. R. As. Soc. No. 43, 15.

PERAK: Larút Hills, at 4500 ft., Ridley; at Gunong Ijuk, Scortechini 1187. Pahang: Kluang Terbang and Gunong Benom, Barnes.—DISTRIB. Burma.

8. ÆSCHYNANTHUS RHODODENDRON, Ridley in Journ. Linn. Soc. XXXII. 500 (1895). An erect epiphytic shrub, 1 to 2 ft. high; stems stout, woody. Leaves opposite, in distant pairs, fleshy-coriaceous; ovate, acuminate; 2 in. long, 1·5 in. wide; nerves inconspicuous; keel prominent. Flowers several together, axillary and terminal; pedicels about ·5 in. long. Calyx tubular, deep purple, 1 in. long; lobes short, acute, glabrous. Corolla 3 in. long; tube thick, dilated above, glabrous; lobes oblong, rounded, ·5 in. long, pubescent, deep red with 3 black streaks on the lower lobes. Stamens very shortly exsert, little longer than the corolla, pubescent. Capsule cylindric, rather stout, 4 in. long; base narrowed into a gynophore. Seeds with a single hair at each end, brown, scabrid. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 15.

Perak: Larút Hills at 2500 to 6000 ft. elevation, Ridley; Curtis 1311; Scortechini 58, 388; Plus River, Scortechini 468; King's Collector 2332.

9. ÆSCHYNANTHUS LONGICALYX, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 16 (1905). Stems woody, over 1 ft. long. Leaves thick, fleshy, glabrous; ovate, acuminate; 2 to 3 in. long, 1 to 1.5 in. broad; midrib prominent; nerves obscure. Flowers large, terminal; pedicels .5 in. long, Calyx elongate, tubular, glabrous, red, 1.25 in. long, with 5 long thin lanceolate acute lobes .5 in. long. Corolla red with dark blotches in the mouth, 3 in. long, glabrous without; mouth pubescent; lobes rounded. Stamens nearly as long as corolla, pubescent. Style stout, pubescent; stigma capitate.

Perak: Scortechini 36; at Gunong Batu Putih, Wray 1636. Selangor: Semangko Pass, A. M. Burn-Murdoch.

10. ÆSCHYNANTHUS LOBBIANA, Hook. Bot. Mag. t. 4260 (1846). A climbing epiphyte, with slender stems rooting along tree-trunks. Leaves in pairs, coriaceous, lanceolate or ovate-lanceolate, glabrous; 1.5 to 2 in. long, .25 to .75 in. broad; petioles short. Flowers in axillary and terminal fascicles 3 to 5 together; pedicels slender, .75 in. long or less. Calyx tubular, 1 in. long, dark purple, thickly pubescent; lobes very short. Corolla-tube 2 in. long, thick, curved; lobes deep red, thickly pubescent, broad, rounded. Stamens barely exserted. Capsule 13 in. long, cylindric on a gynophore. Seed very small, oblong, pustular, with a hyaline mass at the hilum, and a single long white hair at each end. Fl. des Serres Ser. 1, t. 246; Miq. Fl. Ind. Bat. II. 721; Clarke in

Hook. f. Fl. Br. Ind. IV. 343, and in DC. Monog. Phan. V. i. 44; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 16.

Kedah: at Gunong Jerai, Ridley 5513; at Gunong Raya, Langkawi, Curtis 2503. Penang: on Government Hill, Curtis. Perak: in Larút Hills to 5000 ft. alt., Curtis; Wray 873; Scortechini 36, 39, 330, 352. Pahang: at Pekan, Ridley; at Kuautan, Durnford. Selangor: on Pahang track, Ridley. Malacca: Maingay (K.D.) 1218, 1219; Mount Ophir and Ayer Panas, Ridley 1572. Johore: at Batu Pahat, Ridley; at Gunong Pulai, G. King; at Jambu Larang, Fielding. Singapore: at Sungei Tengeh, Ridley 2710, at Kranji, Ridley 2706.—Distrib. Java. Sumatra. Borneo.

King's Collector No. 2636, from Larút, Perak, is a specimen with very fleshy leaves, but cannot yet be separated from Æ. Lobbiana, as there are in the series intermediates between it and the thin-leaved forms. It seems to occur only at high elevations.

11. ÆSCHYNANTHUS RADICANS, Jack in Trans. Linn. Soc. XIV. 43 (1823). An epiphytic plant growing on trees or rocks, the hairy stems creeping and rooting at the nodes, several feet long. Leaves hairy, shortly petioled; ovate, obtuse, broad at base; 5 to 1.25 in. long, 5 to .75 in. wide. Flowers axillary, 1 to 2 together; pedicels 5 in. long. Calyx tubular, hairy, deep red; lobes obtuse or subacute, .75 in. long. Corolla red, thick, curved, hairy; lobes subacute, glabrescent within. Stamens hardly exsert; filaments glabrous. Capsule cylindric, pubescent, acuminate, slender, 10 in. long. Calc. Journ. Nat. Hist. IV. 62; Spreng. Syst. II. 838; R. Br. in Benn. Pl. Jav. Rar. 115, and in Ann. Sc. Nat. 2, Vol. XIII. 160; DC. Prodr. IX. 202; De Vriese Pl. Ind. Bat. Reinw. 10; Miq. Fl. Ind. Bat. II. 720; Clarke in Hook. f. Fl. Br. Ind. IV. 343, and in DC. Monog. Phan. V. i. 41; Ridley in Journ. Linn. Soc. XXXII. 501, and in Journ. Str. Br. R. As. Soc. No. 43, 17. Trichosporum radicans, Nees in Flora (1825), 144; Blume Bijdr. 764.

PERAK: Bujong Malacca, Ridley; Sungei Rayah, Scortechini 37. TRINGGANU: Bundi, Rostado. MALACCA: Griffith (K.D.); Cuming 2387; Sungei Rambai, Derry 205; Sungei Ujong, Cantley.—DISTRIB. Sumatra, Java, Borneo.

VAR. lanuginosa, Ridley. Calyx green, densely white woolly, as is the outside of the corolla-tube.

PERAK: Scortechini 330.

12. ÆSCHYNANTHUS WALLICHII, R. Br. in Benn. Pl. Jav. Rar. 116 (1840). Stems rather slender, woody, glabrous. Leaves glabrous; lanceolate or elliptic, acuminate, narrowed at the base into the petiole; 3 in. long, 1 to 1.25 in. wide; petiole .25 in. long. Flowers few together,

subterminal; pedicel ·25 in. long, slender. Calyx small, cupshaped, green, ·25 in. long, hairy, almost entire. Corolla dark red, ·75 in. long; tube stout; lobes rather large, rounded, hairy. Stamens included; filaments glabrous. Capsule 8 in. long, narrow, terete. Ann. Sc. Nat. 2. XIII. 160; Clarke in Hook. f. Fl. Br. Ind. IV. 343, and in DC. Monog. Phan. V. i. 48; Ridley in Journ. Linn. Soc. XXXII. 502, and in Journ. Str. Br. R. As. Soc. No. 43, 18. Æ. radicans, Wall. Cat. 798 A (non Jack).

РЕВАК: Bujong Malacca, Curtis; Тара, Wray 1417. Malacca: Mount Ophir, Lobb, Maingay (K.D.) 1219. Johore: Tanjong Kopang, Ridley; Ulu Batu Pahat, Kelsall. Singapore: Wallich 798A; Bukit Mandal, Chanchu Kang, Kranji, Ridley.—Distrib. Sumatra, Borneo.

13. ÆSCHYNANTHUS OBCONICA, Clarke in DC. Monog. Phan. V. i. 50 (1883). Stems about a foot long or more, woody, glabrous. Leaves in pairs, coriaceous, glabrous; elliptic oblong or ovate, acuminate, narrowed at base into the petiole; 1.5 to 3 in. long, .75 to 1.25 in. broad; petiole .25 in. long. Flowers subterminal, a few in a cluster; pedicels .25 in. long, hairy. Calyx deep red, obconic, wide, hairy, .25 in. long; mouth entire. Corolla .5 in. long; tube thick and short; lobes rounded, hairy, deep red with yellowish-white central bars. Stamens very shortly exsert; filaments nearly glabrous. Capsule 8 in. long, cylindric. Clarke in Hook. f. Fl. Br. Ind. IV. 343; Bot. Mag. t. 7336; Ridley in Journ. Linn. Soc. XXXII. 501, and in Journ. Str. Br. R. As. Soc. No. 43, 18.

Perak: Batu Kuran and Bujong Malacca, Curtis 2990, 3335; Larút Hills, Ridley 2905; Blanja and Relan Tujor, Wray 149, 1772; Scortechini 28, 1861; Larút Peak at 2000 to 3000 ft., King's Collector 2012, 2849, 10179. Dindings: Pangkore, Curtis 1338. Selangor: Klang, Beccari.—Distrib. Borneo (Motley 687 fide Hook. f.).

The following Sumatran species is herein described.

ESCHYNANTHUS FORBESII, Ridley, nov. sp. An epiphytic shrub; stems creeping; branches slender, about a foot long. Leaves opposite, fleshy; ovate-lanceolate, acute; 2 to 2.5 in. long, .5 in. broad; midrib elevated, other nerves inconspicuous; petiole .2 in. long. Flowers subsolitary, axillary; pedicels .2 in. long. Calyx-lobes free to the base, extremely short, linear or acuminate, tips setiform, .2 in. long. Corolla-tube nearly .75 in. long, slightly curved and dilated upwards, pubescent, scarlet. Style hairy.

SUMATRA: Mount Dempo, 5700 ft., Forbes 2268. Rather remarkable for its very

[Æschynanthus Forresh, Ridley, nov. sp. Frutex epiphyticus; caules reptantes, ramis 30 cm. longis gracilibus. Folia opposita, carnosa, ovato-lanceolata, acuta; 5-6 cm. longa, 10-15 mm. lata; præter costam elevatam nervis inconspicuis; petioli 5 mm. longi. Flores subsolitarii axillares; pedicelli 5 mm. longi. Calycis lobi ad basin liberi, brevissimi, lineares vel acuminati, 5 mm. longi, apicibus setiformibus. Corollæ tubus

ad 2 cm. longus, paullo curvatus et sursum dilatatus, pubescens, coccineus. Stylus pubescens.

Sumatra: ad Montem Dempo 1700-1800 m. alt. calycis lobis minimis distincta.]

2. AGALMYLA, Blume.

Climbing epiphytic shrubs, with loose bark. Leaves alternate, long petioled, herbaceous, lanceolate or ovate-lanceolate. Flowers showy, scarlet, in compact axillary cymes. Calyx deeply 5-cleft; lobes narrow, acute. Corolla tubular, ventricose above, 2-lipped; lobes 5, ovate, obtuse. Stamens 2 perfect, long exsert; filaments slender; anthers connivent, imperfect; staminodes 2 to 3. Disk annular, thick. Ovary superior, linear, glabrous; style as long as or longer than the stamens; stigma 2-lipped. Capsule linear, long, 2-valved loculicidally. Seeds small, oblong, with a single hair at each end.—Distrib. Species 3, in the Malay Peninsula and Archipelago.

1. AGALMYLA STAMINEA, Blume Bijdr. 767 (1826). Stems very long. twining, hairy, at length glabrous. Leaves light green; elliptic-oblong, acuminate at both ends; lower surface strigose; 8 to 12 in. long, 3 to 4 in. broad; main nerves 8 to 10 pair; petiole 6 to 8 in. long, hairv. Cumes subsessile; bracts lanceolate; pedicels strigose. Calyx 5 in. long; lobes lanceolate, acute, pubescent, free nearly to base. Corolla 1 in. long, curved, dilated, scarlet, pubescent; lobes short, rounded. Stamens exsert for 1 in., glabrous; anthers oblong. Style stout, often very short, glabrous. Capsule 14 in. long, slender. R. Br. in Benn. Pl. Jav. Rar. 116, and in Ann. Sc. Nat. 2, XIII. 161; DC. Prodr. IX. 263; Hook. Ic. Pl. t. 733; De Vriese Pl. Ind. Bat. Reinw. 10; Hook. Bot. Mag. t. 5747; Fl. des Serres Ser. 1, t. 358; Mig. Fl. Ind. Bat. II. 722; Clarke in DC. Monog. Phan. V. i. 56; Ridley in Journ. Linn. Soc. XXXII. 502, and in Journ. Str. Br. R. As. Soc. No. 43, 19. Justicia parasitica, Lam. Ill. I. 42 (non Vahl). Cyrtandra staminea, Vahl Enum. I. 105.

Perak: Larut Hills, *Curtis* 2042, and *Ridley* 2916; Maxwell's Hill, 3000 ft., *Fox* and *Scortechini* 295; *Wray* 2800; at 1000 to 3500 ft. *King's Collector* 2053, 2349, 2396, 6970.—Distrib. Java, Sumatra (*Forbes* 1864, 1948).

3. DIDISSANDRA, Clarke.

Shrublets or herbs, with short or tall stems, hairy. Leaves opposite, in remote pairs or crowded at the tip. Flowers solitary on subterminal peduncles or several on short axillary peduncles; bracts small, usually arrow. Cnalyx-lobes 5, free to the base or nearly so, lanceolate or ovate. Corolla blue, white, pink or yellow, narrowly tubular, dilated upwards,

occasionally broadly tubular, infundibuliform; limb bilobed, usually unequally; lobes rounded. Stamens 4 perfect, in two pairs; filaments long, slender; anthers ovate or elliptic adhering by their faces; cells parallel, connective sometimes prolonged into a horn. Disk annular, small. Ovary cylindric, sessile; style as long or longer; stigma broad, ovate. Capsule cylindric, linear elongate, rarely short and thick, sessile, splitting along the upper edge, not twisted.—DISTRIB. Species about 20, in India, in the Malay Peninsula and Sumatra.

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Stems tall; nodes distant; flowers several together in axillary
clusters; leaves hairy above:-
  Leaf-margins entire
                                                          .. 1. D. johorica.
  Leaf-margins minutely crenulate
                                    · . . .
                                                              2. D. frutescens.
Stems short; leaves crowded at apex; flowers 1, rarely 2 or
more, on subterminal peduncles:- ..
  Leaves hairy above, their margins serrate or dentate:-
    Capsule slender, cylindric:- .. ..
        Sepals lanceolate acuminate, .25 in. long :-
          Leaves simply serrate
                                                         .. 3. D. hirta.
                                                         .. 4. D. serratifolia.
          Leaves doubly serrate
        Sepals oblong-ovate, 125 in. long
                                                         .. 5. D. atrocyanea.
                                                          .. 6. D. latisepala.
      Capsule short, thick, fusiform ...
  Leaves glabrous above:-
                                   . .
      Leaf-margins entire, sinuate or obscurely crenulate:-
          owers orange .. .. .. .. Flowers violet-purple:-- .. ..
        Flowers orange
                                                         .. 7. D. flammea.
                                                          . 8. D. violacea.
            Corolla-tube slender, infundibuliform
            Corolla-tube wide, cylindric
                                                          .. 9. D. atropurpurea.
      Leaf-margins serrate, or dentate, or lobed :-
        Sepals glabrous :-
           Leaves simply dentate; corolla white with violet
          markings, pubescent
                                                         .. 10. D. Wrayi.
          Leaves runcinate; corolla lemon-yellow, glabrous 11. D. quercifolia.
        Sepals more or less pubescent:-
          Leaves coarsely serrate; sepals linear lanceolate .. 12. D. glabrescens.
          Leaves deeply lobed; sepals elliptic
                                                         .. 13. D. filicina.
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1. Didissandra johorica, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 22 (1905). Shrubby, 2 to 3 ft. high; stems pustular below, hairy above. Leaves alternate below, opposite above; lanceolate, acuminate, long-cuneate at base; margins entire; upper surface sprinkled with short conic hairs, lower shortly scabrid-hairy; 6 in. long, 1.25 inbroad; main nerves 6 to 7 pairs, ascending. Cymes axillary; peduncles slender, hairy, 1 in. long; bracts short, linear lanceolate; flowers 3 to 4 to each peduncle. Calyx-lobes small, linear lanceolate, acute, hairy.

Corolla pink. Capsule slender, cylindric, hispid, 1.5 in. long. D. sp., Ridley in Journ. Linn. Soc. XXXII. 502.

JOHORE: at Gunong Panti, Ridley 4175.

2. Didissandra frutescens, Clarke in DC, Monog, Phan. V. i. 67, t. VII (1883). A shrub with woody stems, 3 to 4 ft. high; stems appressed hairy. Leaves opposite, in alternate pairs, distant; ellipticlanceolate to oblanceolate, subacute at apex, cuneately narrowed at base; margins minutely crenulate; upper surface sprinkled with fine hairs, lower with appressed tawny silky hairs, especially on the nerves and reticulations: 7 to 9 in. long, 3 to 4 in. broad; main nerves about 12 to 20 pair; petiole 1.5 to 3 in. long, hairy. Cymes axillary, sessile, with short hairy branches 1 in. long; flowers 1 to 3 to each branch. Caluxlobes red, hairy, narrow, lanceolate. Corolla white, 1.5 in, long; tube funnel-shaped, pubescent; lobes rounded. Anthers ovoid; filaments curved in the middle. Ovary glabrous; style pilose; stigma sub-bilobed. Cansule slender, cylindric, 3 in. long, glabrous, longitudinally ribbed. Clarke in Hook, f. Fl. Br. Ind. IV. 355; Ridley in Journ. Linn. Soc. XXXII. 502, and in Journ. Str. Br. R. As. Soc. No. 43, 21. Didymocarpus frutescens, Jack in Malay Misc. 1, part 2, 5, in Trans. Linn. Soc. XIV. 39, and in Calc. Journ. Nat. Hist. IV. 58 (1844); Wall. Cat. 780: R. Br. in Benn. Pl. Jav. Rar. 119, and in Ann. Sc. Nat. 2. XIII. 165; DC. Prodr. IX. 265; Mig. Fl. Ind. Bat. II. 726. Henckelia frutescens, Spreng. Syst., curæ post. 13.

Penang: Wallich 780; Curtis 828; Deschamps. Perak: at Tapa, Wray 826, at Waterfall Hill, Wray 1723; Ridley 2912; Scortechini; near Kinta River, King's Collector 837. Dindings: at Lumut, Ridley 7171. Malacca: Griffith (K.D.) 3856; Maingay (K.D.) 1222.—Distrib. Sumatra.

3. Didissandra hirta, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 28 (1905). Stem woody, 3 in. long. Leaves oblanceolate, oblique, acuminate at apex, narrowed to the base; margins serrate; upper surface sprinkled with pale multicellular hairs, especially long on the marginal teeth; lower glabrous except on the midrib and nerves, which are covered with rather long multicellular hairs. Scape 3 to 4 in. long, hairy with catenulate multicellular hairs. Calyx-lobes '25 in. long, lanceolate, acuminate, very hairy. Corolla violet with a darker centre; tube 1 in. long, broad-cylindric, sprinkled with multicellular hairs'; lobes large, rounded, '5 in. long, glabrous. Stamens 2 pairs, unequal. Stigma capitate.

PERAK: at Bujong Malacca, Ridley.

4. DIDISSANDRA SERRATIFOLIA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 25 (1905.) Stem woody, 4 to 5 in. high, covered in the upper part with red hairs. Leaves opposite, oblanceolate, acuminate at apex,

long-cuneate at base; margins doubly serrate; upper surface sprinkled with pale multicellular hairs, lower glabrous except for the red multicellular hairs on the nerves and midrib; 6 to 10 in. long, 1.75 to 2.25 in. broad; main nerves 16 to 20 pairs; petiole 1 in. long or less, hairy. Flowers solitary on a slender hairy 4 in. long peduncle. Calyx-lobes lanceolate, acuminate, '25 in. long, recurved, at length covered densely with red multicellular hairs. Corolla blue, 1.5 in. long; tube narrowed at the base, dilated upwards, broad, sparingly hairy; lobes rounded, the lower ones longer than the upper. Stamens in 2 subequal pairs, half as long as the corolla-tube; filaments attached close to the base, sinuate. Style stout; stigma capitate. Capsule 1.5 in. long, subcylindric, thick, '125 in. broad, glabrous.

PERAK: at Bujong Malacca, Ridley 9779.

5. DIDISSANDRA ATROCYANEA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 26 (1905). Stem woody, about 6 in. high. Leaves crowded at the top of the stem, oblong or lanceolate-oblong, inequilateral at the base; margins strongly serrate; black when dry; upper surface sprinkled with conical processes formed by the pushing in of the leaf from the under surface, each process bearing a short pale hair; lower surface punctate and marked with the mouths of the intrusions, glabrous except for the nerves and reticulations, which are covered with rufous hairs; 4 to 5 in. long, 1 to 2 in. broad; petiole winged to the base, covered with multicellular hairs. Flowers solitary on 3 in. long peduncles covered with red hairs. Calyx-lobes oblong ovate, glabrescent or with red hairs, 125 in. long. Corolla deep purple with almost black mouth, nearly 2 in. long; tube shortly narrowed at base, broadly cylindric above, pubescent; lobes short, rounded, the lower lip the longer. Stamens 4; filaments slender. Capsule glabrous, cylindric, curved, 1 to 2 in. long.

PERAK: at Bujong Malacca, Ridley, Curtis 3298; Scortechini 368, 1896; at Gunong Batu Putih, Wray 310.

6. Didissandra latisepala, Ridley in Journ. Linn. Soc. XXXII. 503 (1895). Stem short, woody. Leaves crowded at the top of the stem, oblong-oblanceolate, unequal at base; margins crenate-dentate; surfaces sparingly hispid, red; midrib and nerves beneath covered with red hairs; 7 in. long, 2 in. broad; petiole 1 in. long. Flowers few on a 6 in. long hispid peduncle. Calyx-lobes ovate, 125 in. long, glabrous. Corolla purple (?), 1 in. long, glabrous; tube cylindric, dilated upwards; lobes short, rounded. Stamens 4; filaments linear; anthers subglobose. Ovary glabrous; stigma clubbed. Capsule short, 5 in. long, thick, fusiform. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 26.

LEGEH: Machado.

7. Didissandra flammea, Ridley in Journ. Linn. Soc. XXXII. 503 (1895). Stem about 2 in. long, hardly woody, pubescent. Leaves oblong, obtuse, glabrous; upper surface shining; margins and nerves beneath hairy; 4 in. long, 1.25 in. wide; petiole short, pubescent. Flowers few, pendulous on an erect stout, purple, pubescent peduncle 3 in. long. Calyx-lobes narrowly lanceolate, acuminate, green with purple hairs, 5 in. long. Corolla orange red with darker red lobes; tube narrow at base, abruptly dilated, cylindric, hairy outside; lobes short, rounded, the lower ones a little longer. Stamens in 2 pairs; filaments slender, terete, hispid above, white; anthers globose. Ovary white, pubescent, straight; stigma clavate. Disk annular. Capsule short, cylindric, purple, 1.5 in. long. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 22.

LEGEH: gold mines north of Tringganu, Machado.

8. Didissandra violacea, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 23 (1905). Stem woody, about 6 in. high. Leaves tufted at the top of the stem, thin, oblanceolate, subfalcate, narrowed at the base into the petiole, acuminate at apex; margins sinuate; upper surface glabrous; midrib and petiole covered with red multicellular hairs; 4 to 7 in. long, 1 to 2 in. broad. Flower-peduncles numerous, erect, 2 to 3 in. long, sparingly red-hairy, 1-flowered; bracts linear-lanceolate, narrow, 25 to 5 in. long, closely appressed to the calyx. Calyx-lobes linear-lanceolate, glabrous, 25 to 5 in. long. Corolla violet, 1 to 1.5 in. long; tube rather narrow, gradually dilated upwards, sparingly pubescent; lobes unequal, the lower lip the longer. Stamens in 2 pairs, the longer pair scarcely one-fourth longer than the shorter. Ovary glabrous, rather short; stigma broad. Capsule 1.5 in. long, moderately thick, splitting along the upper edge.

PERAK: summit of Gunong Batu Patih, at 6700 ft., Wray 383; Scortechini 389.

This species comes near to D. Wrayi, but has smaller flowers.

9. Didissandra atropurpurea, Ridley in Journ. Linn. Soc. XXXII. 504 (1895). Stem woody, 2 in. long. Leaves lanceolate or obovate, narrowed at the base, the bases unequal; margin obscurely crenate; upper surface glabrous, lower hairy on the raised nerves; 4 in. long, 1.5 in. broad; petiole 1 to 1.5 in. long. Flowers nearly sessile, in pairs on erect, glabrous, purple peduncles 3 to 5 in. long; bracts 2, ovate, 25 to 5 in. long, 125 in. wide, purple. Calyx-lobes nearly free to the base, lanceolate, acute, 25 to 35 in. long, glabrous. Corolla deep purple, 2 in. long, 5 in. broad, narrowed at the base, widely dilated

above; lobes short, rounded, the lower ones the longer. Stamens in 2 pairs; filaments straight; anthers oblong, appressed. Style thick, glabrous; stigma clavate. Capsule thick, 2 in. long, narrowed at the tip. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 23.

PERAK: on rocks at Hermitage Hill, Ridley; at Gunong Inas, Scortechini 1327.

Wray 3903, from Gunong Bubu, 5000 ft., "flowers mauve, five white stripes in tube," may be this or a new species near it, but the flowers are solitary on the peduncles.

10. Didissandra Wrayi, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 24 (1905). Stem woody, bare below. Leaves alternate, lanceolate, oblique, acuminate at apex, narrowed at the base into the petiole; dentate on the margin; glabrous on the upper, whitish on the lower surface; 4 to 6 in. long, 1.5 to 2 in. broad; main nerves 16 pairs, raised on both surfaces; midrib and nerves beneath covered with coarse reddish trichomes; petiole 5 in. long, covered with rough multicellular trichomes. Flowers solitary, on 3 to 4 in. long slender peduncles from the upper axils, their bases covered with red multicellular hairs; bracts 2, ovate, broad, glabrous, appressed to the calyx, 25 in. long. Calyx-lobes broadly lanceolate, obtuse, glabrous, 5 in. long, white. Corolla white pencilled with violet, 1.25 to 1.5 in. long; tube thick, over 25 in. through; lobes broad, rounded. Stamens 4, didynamous; anthers rounded. Style short. Capsule slender, 1.5 to 2 in. long, glabrous.

PERAK: summit of Gunong Batu Putih, 6700 ft., Wray 334, 353;

King's Collector 8036.

11. Didissandra quercifolia, Ridley in Journ. Linn. Soc. XXXIII. 504 (1895). Stem woody, hairy, 6 in. long or less. Leaves crowded above, lanceolate-runcinate; base narrowed; upper surface deep green, glabrous; lower glaucous with the midrib and nerves covered with brown hairs; 2 to 8 in. long, 1 to 2 in. broad; petiole 1 in. long or less, hairy. Flowers large, 1 to 2 on 6 in. long sparsely hairy peduncles; bracts lanceolate, broad, hispid. Calyx-lobes broadly lanceolate, obtuse, green, glabrous. Corolla lemon-yellow, glabrous, 2 in. long; tube dilated, cylindric from a narrow base; lobes short, rounded. Ovary cylindric; stigma clavate. Capsule 3 in. long, glabrous, cylindric. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 26.

Perak: Bukit Rengas, Fox 10683; Maxwell's Hill, 3000 ft., Scortechini 292, 300; Curtis 2041; Ridley 2910.

King's Collector 2171, from Larút Hills, 3000 to 3500 ft., seems to be this, but is much larger, the stem whitish corky, nearly 12 in. long, the peduncles up to 4-flowered.

12. Didissandra glabrescens, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 24 (1905). Stem woody. Leaves elliptic-lanceolate or oblanceolate; margins coarsely serrate; upper surface glabrous, lower dotted, glabrous except on the red hairy midrib and nerves; 4 to 7 in. long, 1 to 2.5 in. broad; petiole 1 in. long, hairy. Flowers solitary on 4 to 5 in. long hairy peduncles; bracts 1 to 2, lanceolate, oblong, .125 to .25 in. long. Calyx-lobes linear-lanceolate, obtuse, hairy, .25 to .5 in. long. Corolla mauve (Wray), deep blue (King's Collector), 1.5 in. long; tube gradually dilated upwards; lobes rounded, pubescent. Anthers subglobose. Stigma capitate, broad. Capsule 1.5 to 2.5 in. long, cylindric, slender.

PERAK: summit of Gunong Batu Putih, 6700 ft., Wray 384; do., 2000 to 3000 ft., King's Collector 8055; Kinta at 3000 to 3500 ft., King's Collector 7191.

13. Didissandra filicina, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 27 (1905). Stem woody, pale, rather slender. Leaves lanceolate, deeply lobed with oblong rounded lobes about 13 on each side; glabrous above, paler beneath, with red appressed hairs on the midrib; 3 to 5 in. long, 1 to 1.5 in. broad; petiole .5 in. long with red appressed hairs. Flower 1 on a slender, red, hairy peduncle 1.5 in. long; bracts very small, ovate, about .1 in. long; pedicel .25 in. long. Calyx-lobes elliptic, rounded, dark red, sparingly hairy, .1 to .2 in. long. Corolla 1.5 in. long; tube with narrow base, dilated upwards, trumpet-shaped, sparingly pubescent at the base, purple, paler below outside, inside dark purple, with 6 white lines down the base; lower lip longer than the upper; lobes rounded. Stamens 4, in 2 pairs, the connective prolonged in a triangular horizontal horn. Disk annular. Capsule subfollicular, 1.5 in. long, glabrous.

Perak: at Gunong Chabang, on rocks overhanging a creek, Scortechini 14.

4. DIDYMOCARPUS, Wall.

Herbs or usually small shrubs; stems simple or branched, erect or prostrate. Leaves herbaceous, opposite or the alternate ones reduced, seldom wanting, ovate or lanceolate, usually pubescent or hairy, petioled. Peduncles axillary, bearing one or more flowers in a cyme. Calyx-lobes 5, short, free to the base or nearly so. Corolla infundibuliform, bilabiate; lobes equal or the lower ones longer than the upper. Stamens 2 complete; filaments filiform, rising from about halfway down the tube; anthers reniform, connivent by the edges; staminodes 2, short, hooked. Ovary cylindric, passing into the style; stigma capitate or ovate, entire. Disk annular or absent. Capsule cylindric,

narrow, usually splitting along the upper edge. Seeds numerous, minute, ellipsoid, not plumed.—DISTRIB. Species about one hundred, in India and Malaya.

Sect. I. ELATÆ:—					
Stem tall, branched, shrubby; leaves in	distant)	pair	rs,		
unequal; bract 1, cupshaped	••	٠.	1.	D.	corchorifolia.
Stem long and weak; bracts 2, ovate			2.	D.	sulphurea.
Stem weak:—					
Bracts ovate, amplexicall; flowers yellow			3.	$\mathcal{D}.$	citrina.
Bracts oblong, glabrous; flowers claret cold	our		4.	D.	purpurea.
Sect. II. DIDYMANTHUS:—					
Stem erect, herbaceous; leaves in distant pair	rs:—				
Flowers very small, 25 in. long, axillary		٠.	5.	D.	parviflora.
Flowers medium-sized:—					
Flowers yellow:—					
Leaves lanceolate acute	••		6.	D.	flava.
Leaves ovate acuminate			7.	D.	ramosa.
Leaves unequal, narrowly lanceolate	••		8.	D.	flavescens.
Flowers white:—					
Leaves opposite, equal, hairy, ovate:-	- 11 - 11 - 12				
Edges pubescent			9.	D.	hispida.
Edges conspicuously red-hairy			10.	D.	hirta.
Leaves lanceolate, thinly pubescent		٠	11.	D.	viscida.
Leaves subglabrous, equal, long-petiole	d		12.	D.	albina.
Leaves glabrous, unequal:—					
Flowers solitary, on short peduncles			13.	D.	alternans.
Flowers in pairs on long peduncles					
axils			14.	D.	glabrata.
Stem erect, herbaceous, little-branched; flower	ers yellow;				
corolla cylindric, trumpet-shaped:-					
Leaves petioled, silky, in distant pairs :-					
			15.	D.	malayana.
Corolla 1 in. long			16.	D.	albomarginata.
Leaves crowded above, hairy:-					
Stem slender; flowers small, congested			17.	$\mathcal{D}.$	flavobrunnea.
Stem woody:—					
Leaves glabrous, congested at the top, no	ot petioled;				
flowers yellow		• •	18.	D.	longipes.
Leaves alternate lanceolate, inæquilatera	l; flowers				
blue	•		19.	D.	inæqualis.
Leaves crowded or distant, elliptic,	petioled;				
flowers white			20.	D.	alba.
Sect. III. REPTANTES. Prostrate or creeping herl	os. Leaves				
in distant pairs, equal or unequal, hairy or pubes					
Flowers blue or white, sometimes with yellow					
Leaves hairy, rarely glabrous; flower in					
axil, peduncle short			21.	D.	reptans.
$m{g}$					

Leaves velvety, elliptic:—				
Flowers solitary, terminal	••			. ophirensis.
Flowers numerous, on slender pedicels	• • •	2	23. D	. pulchella.
Flowers orange-yellow:—				
Calyx-lobes hairy	••			. crocea.
Calyx-lobes narrow, subglabrous	••		25. D	. ascendens.
Sect. IV. HETEROBÆA. Stems woody, usua	lly short, wi	th		
the leaves crowded towards the top, more				
above, and little or not branched. Leaves l				
rarely glabrous, lanceolate, serrate, narrowe				
into a winged petiole, alternate. Peduncles		il-		
lary in the upper axils, 1- rarely 2-flower	ered. Brac			
usually small, solitary, linear. Corolla				
white crimson or blue, rarely yellow; fil	aments lor	ıg,		
slender. Capsule narrow, cylindric:-				
Flowers solitary, bracts very small:—				
Leaves glabrous, wrinkled	••	•• '	26. D	. rugosa.
Leaves tessellate, not wrinkled, obovat	e, glabrous	or		
with scattered hairs with swollen bases:	-			
Capsule over 2 in. long	••	2	27. D	platypus.
Capsule shorter, 1 in. long		9	28. D	. Kompsobæa.
Leaves not tessellate, hairy or pubescen	t.			
Leaves broad, covered with close short				
Flowers white, tipped with crimson			29. I). quinquevulnera.
Flowers deep crimson			30. L	. atrosanguinea.
Leaves narrow, lanceolate, densely l	nairy, distan	nt;		
	at		31. D	. hirsuta.
Leaves silky pubescent on both sur	faces; flow	ers		
white, tinged with pink or blue			32. L). bombycina.
Leaves crowded, thickly appressed,	hairy; flowe	ers		
white or blue	• • • • • • • • • • • • • • • • • • • •		33. D	. crinita.
Leaves crowded, covered with short s				
above, deep green with central white	e bar; flow	ers		
white				. fasciata.
Flowers in pairs on a long peduncle; brace			. D.	venusta.
Sect. V. Salicine. Small shrubby plants	with narre	wc		
leaves crowded at top. Flowers small:-				
Leaves entire	••	:	36. D	. densifolia.
Leaves serrate:—				
Flowers ·125 in. long, pink	12		37. D	. salicina.
Flowers .75 in. long, white with purple of				
in mouth				. serratifolia.
Leaves deeply cut, pinnate	•		39. D	. pectinata.
Sect. VI. Acaules. Stemless or nearly so; le	aves crowde			
Flowers panicled, lips very unequal	••	4	0. D	. violacea.
Flowers 1- 2-racemose:—				
Flowers large, blue		. 4	1. D	. lacunosa.
Flowers small:—				
Leaves elliptic, peltate		4	2. D	. perdita.

Leaves obovate, crenulate:—
Capsule very short and broad ... 43. D. puncticulata.
Capsule linear, narrow ... 44. D. heterophylla.
Leaves small, entire, silky ... 45. D. pumila.

Affinity doubtful.
Stem tall; leaves alternate, distant. Panicles small, adnate to petioles 46. D. lilacina.

Sect. I. ELATE.

1. DIDYMOCARPUS CORCHORIFOLIA, R. Br. in Benn. Pl. Jav. Rar. 119 (1840). A shrub, 4 to 6 ft. high, much branched, with a stout woody stem. Leaves opposite but unequal, ovate, subacute, inæquilateral, rounded at base; margins serrate; both surfaces, but especially the under, covered with soft, short, felted hair: 3 to 9 in, long, 1.5 to 5 in. broad; petiole 1 to 3 in. long. Panicles lax, axillary, 2 to 3 in. long; peduncles short, pubescent; flowers numerous; bracts cupshaped. Calux cupshaped. 25 in. long. shortly 5-toothed. Corolla 75 in. long. white applegreen in the throat or often purplish-white; tube straight. thick; lobes rounded, the upper lip recurved, the base appressed to the broad decurved lower lip which is much longer. Cansule cylindric. 1 to 2.5 in. long, pubescent, splitting to near the tip. Ann. Sc. Nat. 2. XIII. 164; Wall. Cat. 792; DC. Prodr. IX. 265; Mig. Fl. Ind. Bat. II. 726: Clarke in DC. Monog. Phan. V. i. 85, and in Hook. f. Fl. Br. Ind. IV. 351; Ridley in Journ. Bot. XXVIII. 68 (1890), and in Journ. Str. Br. R. As. Soc. No. 43, 31.

Penang: Wallich 792; Government Hill, Curtis 1239; Maingay (K.D.) 1227. Selangor: Pahang track and Semangko, Ridley 8553. Perak: Bujong Malacca, Ridley 9775, Curtis 3130; Gunong Hijau, Scortechini 1266; Kinta, at 1500 to 2000 ft., King's Collector 7220; 2000 to 3000 ft., King's Collector 10979, 10998.

2. Didymocarpus sulphurea, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 32 (1905). A shrubby creeper 6 to 10 ft. long; stem pubescent, branched, with long internodes. Leaves opposite but very unequal, one up to 3 in. long by '75 to 1.75 in. broad, the opposite one '5 to '75 in. long, '15 to '25 in. wide; ovate or lanceolate, acute; base unequal, cuneate; margins crenulate dentate; deep green above, purple beneath; nerves 6 to 7 pairs elevated on both surfaces, sprinkled all over on both surfaces with short hairs, more hairy on the back. Peduncles axillary, filiform, 4 to 6 in. long, pubescent; branches at the top 2 or 3, each bearing as many flowers; bracts 2 to each pair of flowers, ovate, glabrous, '125 in. long. Calyx-lobes elliptic-ovate, obtuse, glabrous. Corolla infundibuliform, '5 in. long, glabrous; upper lip short recurved, lower one longer. Stamens shortly exsert; filaments thick, pubescent,

Style stout; stigma excavate at the top. Capsule 1.5 to 3 in. long, rather thick, cylindric, acuminate, glabrous.

PERAK: Gunong Hijau, Gunong Chabang and Gunong Bubu, Scortechini 6; Gunong Batu Patih, at 3000 to 4000 ft., King's Collector 8059; do. 4500 ft., Wray 219; Bujong Malacca, Ridley 9774.

VAR. breviflora, Ridley l.c. Bracts and calyx-lobes narrower, acute, pubescent. Corolla smaller, 25 to 5 in. long. Capsule pubescent, 75 in. long.

SELANGOR: Bukit Kutu, Ridley 7582.

3. Didymocarpus citrina, Ridley in Journ. Linn. Soc. XXXII. 508 (1895). A soft weak herb, about 1 ft. high, pubescent. Leaves soft, opposite but unequal, the larger 2 to 3 in. long, 1.25 in. wide; ovate or ovate-lanceolate; velvety; margins crenulate; petiole ·5 to 3 in. long. Panicles axillary, 3 in. long, pubescent at base, glabrate above; bracts ovate cordate, acute, nearly amplexicaul, polished green with red edges; pedicels ·5 to 1 in. long, terete, glabrous. Calyx-lobes triangular, spreading, stiff, green, edges red. Corolla lemon-yellow, pendulous; tube 1 in. long, funnel-shaped, base narrowed, mouth dilate, ·5 in. across; upper lobes broad, rounded, recurved. lower ones larger. Stamens 2; filaments short, sinuate, pubescent; anthers subtriangular. Ovary and style ·5 in. long, pubescent; stigma peltate. Disk cylindric. Capsule 1 in. long, angled, glabrous. Journ. Str. Br. R. As. Soc. No. 43, 32.

KEDAH; Gunong Jereh, at 2000 ft. alt., Ridley 5518.

4. Didymocarpus purpurea, Ridley in Journ. Linn. Soc. XXXII. 508 (1895). Stem herbaceous, 12 to 18 in. high. Leaves ovate, acute, inæquilateral, velvety; 4 in. long, 2 in. broad; margins crenulate; petiole 25 to 5 in. long. Panicle erect, subterminal, 4 in. long, with slender branches; peduncle 3 in. long, glabrous; bracts small, ovate. Calyx-lobes spreading, oblong, glabrous, short. Corolla tubular, purple; tube narrowed at base; lobes rounded, lower ones longer. Stamens 2; filaments filiform, included; staminodes filiform. Ovary cylindric; stigma broad, discoid. Capsule 5 in. long, cylindric, glabrous, stipitate. Journ. Str. Br. R. As. Soc. No. 43, 33.

KEDAH: Lankawi Island on Gunong Chinchau, 1000 to 1500 ft., Curtis 2567.

Sect. II. DIDYMANTHUS.

5. Didymocarpus parviflora, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 33 (1905). A small erect herb about 1 ft. high or less, much branched; stem slender, covered with appressed hairs. *Leaves* opposite, equal; lanceolate, acute; 1 in. long, 25 in. broad; glabrous and puncticulate on the upper surface, on the lower yellow pustular and

with short translucent hairs which are longer and multicellular along the margin, midrib and nerves; nerves 5 pairs; petiole ·25 in. long, hairy. Flowers solitary, axillary on slender hairy peduncles ·25 in. long. Calyx-lobes linear, obtuse, pubescent. Corolla ·25 in. long, yellow-pubescent; tube broad, straight; lobes short, broad, rounded. Stamens nearly as long as corolla-lobes; anthers large, white, reniform; filaments glabrous. Ovary as long as stamens, pubescent; stigma capitate, entire. Capsule slender, pubescent.

NEGRI SEMBILAN: at Gunong Angsi, Ridley.

6. Didymocarpus flava, Ridley in Journ. Linn. Soc. XXXII. 507 (1895). Stem 1 ft. tall, scabrid, branched. Leaves lanceolate acute, base narrowed; denticulate on the margins; scabrid beneath, covered on the nerves with short hairs; 3 in. long, 1.5 in. broad; petiole ·5 in. long. Cymes axillary and subterminal, on hairy peduncles 1 to 2 in. long; pedicels ·5 in. long; flowers 4 or 5. Calyx short; lobes hispid lanceolate. Corolla glabrescent, yellow, ·75 in. long; tube straight, dilated upwards; lobes short, obtuse. Style slender, pubescent. Capsule cylindric, 1.5 in. long, hispid. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 34.

Perak: Larút Hills, Ridley 2914; Curtis 2690; at 2500 to 3000 ft., King's Collector 2151; Scortechini 563.

VAR. purpurascens, Ridley. Stems stouter, over 1 ft. high, hairy. Leaves opposite, equal, obliquely ovate acute, often purple as is the stem.

Perak: Bukit Kapayung, Sungei Siput, Ridley.

7. Didymocarpus ramosa, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 34 (1905). Stem slender, branched, pubescent with appressed hairs, over 1 ft. tall. Leaves distant, opposite, but one of each pair much smaller; ovate acuminate, thin, rounded or slightly narrowed at the base; glabrous above, sparingly hairy on the nerves beneath; nerves about 7 pairs; 2 to 3 in. long, 1.5 in. wide or smaller; petiole 125 in. long. Peduncles slender, from the lower axils, 1.25 in. long, 2-flowered, viscid hairy. Calyx-lobes lanceolate acuminate, viscid hairy, 125 in. long. Corolla-tube straight, hardly dilated, 5 in. long, greenish yellow, bilabiate; lower lobe longer than upper; lobes rounded. Stamens 2; filaments long filiform; anthers oblong. Ovary long-cylindric; style long, slender; stigma capitate, small.

PERAK: Gunong Batu Putih, Wray 868.

8. DIDYMOCARPUS FLAVESCENS, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 35 (1905). Stems slender, over 1 ft. long, covered with short appressed hairs. Leaves distant, opposite but unequal; lanceolate, acuminate at both ends, entire; sprinkled over on both surfaces with

short scattered hairs; 1.5 to 2 in. long, 5 in. wide; petiole 1.5 to 2 in. long, silky-hairy. Peduncles 1-flowered, slender, subterminal, 1 in. long, pubescent. Calyx-lobes linear, hairy. Corolla yellowish-white, 5 in. long, pubescent; tube straight, cylindric, hardly dilated above; bilabiate; lobes short, rounded. Stamens 2; filaments filiform. Ovary short, cylindric; style short, pubescent; stigma capitate.

Selangor: Kwala Kubu, Ridley 7585.

9. Didymocarpus hispida, Ridley in Journ. Linn. Soc. XXXII. 507. (1895). Stem 6 to 12 in. tall, hispid. Leaves opposite, equal; ovate or lanlate, acute or acuminate at both ends; 3 to 5 in. long, 1 to 2 in. wide; scabrid on the upper surface, hairy on the lower, especially on the nerves; petiole 1 in. long. Peduncles 1 to 3, erect from the upper axils, 3 in. long, hairy, with 3 or 4 terminal branches, bearing a few flowers; pedicels hispid, 5 in. long; bracts linear, 25 in. long. Calyx 25 in. long; lobes lanceolate, hairy. Corolla glabrous, 1 in. long, white with violet streaks in the lower lip; tube straight, funnel-shaped; upper lobes ovate subacute, lower ones longer. Stamens 2; filaments slender, nearly straight, filiform; staminodes short, clubbed, 2. Ovary fusiform, pubescent; style terete; stigma capitate. Capsule 1.5 in. long, straight, cylindric. D. hispidula, Ridley in Journ. Str. Br. R. As. Soc. No. 43,35.

PERAK: Larút Hills at 4000 to 6000 ft., Curtis 1312, 2037; Ridley; King's Collector; Scortechini 467?

VAR. ? selangorensis, Ridley. Leaves shorter, glabrous above. Calyxlobes longer. Capsule 3 in. long, softly velvety.

Selangor: Gunong Semangko, Curtis 3752.

10. Didymocarpus hirta, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 36 (1905). Stem herbaceous, branched, about 1 ft. tall, thickly covered with rather long reddish multicellular hairs. Leaves opposite; ovate or ovate-lanceolate, subacute, narrowed at the base; 3 in. long, 1 to 1.5 in. wide; margin serrulate, hairy; rather densely hairy on the upper surface with multicellular hairs; on the lower surface, midrib, and nerves covered with close long pale hairs; petiole 25 in. long, hairy. Peduncles subterminal, 2.5 in. long, very hairy, red; bract very small, linear; flowers solitary on the peduncles. Calyx-lobes linear, narrow, hairy, 15 to 2 in. long. Corolla absent. Capsule 2 in. long, cylindric, closely but very shortly hairy. Ovary cylindric; style long, pubescent; stigma discoid.

SELANGOR: above the gap, Semangko Pass, Curtis.

11. DIDYMOCARPUS VISCIDA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 36 (1905). Stems slender, 6 in. long or more; shortly roughly hairy. Leaves opposite, thin; lanceolate or ovate-lanceolate, acuminate; base inequilateral; upper surface sparingly scabrid hairy, lower hairy on

the nerves; 3 to 4 in. long, 1 to 1.5 in. broad; main nerves about 6 pairs; petiole 5 in. long, roughly hairy. Peduncle subterminal, 2 in. long, viscid hairy; cyme-branches 1 in. long. Calyx-lobes very short, lanceolate, viscid hairy. Corolla rather over 5 in. long; tube swollen at base, then funnel-shaped, white, sparingly pubescent. Stamens 2, included; filaments filiform. Style shorter than stamens. Capsule slender, cylindric, acuminate, viscid hairy, 1 in. long.

PERAK: Gunong Keledang, Ridley 9781.

12. Didymocarpus albina, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 37 (1905). Stem 2 to 3 ft. tall, herbaceous, appressed hairy. Leaves opposite, equal; lanceolate or ovate-lanceolate, acuminate at base and apex; margins shortly serrate; 4 to 6 in. long by 1.5 to 2 in. wide; glabrous except the midrib on the back, which is covered with appressed hairs; petiole appressed hairy, 1.5 in. long. Peduncle axillary, 3 in. long, with a lax few-branched terminal panicle 1 in. long; bracts and bracteoles linear. Calyx-lobes lanceolate acuminate, 1 in. long. Corolla 5 in. long, waxy white, slightly pubescent; tube cylindric; limb distinctly bilobed. Stamens 2; filaments glabrous; anthers ovate-lanceolate. Ovary and style pubescent.

PERAK: Gunong Batu Putih, at 3000 to 4000 ft., King's Collector 8070.

This is allied to D. hispida, Ridl., but with nearly glabrous and more lanceolate leaves and smaller flowers.

13. Didymocarpus alternans, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 37 (1905). Stem about 1 ft. tall, erect, scabrid hairy above, rather slender. Leaves thin; subalternate or opposite; lanceolate acuminate; base inæquilateral cuneate; entire or slightly serrate; 3 in. long by 1.25 in. wide; nearly glabrous except the midrib on the back and petiole, .25 in. long, which are scabrid hairy; opposite leaf reduced to a small ovate blade .5 in. long or wanting. Flowers solitary, axillary on short pedicels, slender, .125 to .25 in. long with 2 linear small bracts, all pubescent. Calyx-lobes lanceolate acute, hairy, .125 in. long. Corolla .5 in. long, white, centre yellow; tube narrowed at the base, dilated upwards, pubescent; lobes subequal, rounded; lips not very distinct. Stamens 2; filaments filiform, included; anthers elliptic, connate; staminodes filiform, short, clubbed. Style fairly long, hairy; stigma capitate. Capsule slender, cylindric, glabrous, 1 in. long.

Perak: at Bujong Malacca, Ridley 9777; Curtis 3133; Larút Hills, 500 to 1500 ft., King's Collector 2311. On banks up to 4000 ft.

14. DIDYMOCARPUS GLABRATA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 38 (1905). A slender branched herb over 1 ft. high, almost

glabrous except for a little pubescence on the stem and petioles. Leaves opposite, subequal or one leaf larger than the other; elliptic or ovate, apex subacute, base cuneate or rounded and oblique; margins entire; 1.5 to 3 in. long, 1 in. broad or less; main nerves 7 pair, with midrib pubescent; petiole slender, pubescent, 25 in. long or less. Peduncles from the upper axils 2-flowered, axillary, 2 in. long, pubescent; bracts very small, linear; pedicels 25 in. long, pubescent. Calyx-lobes narrowly lanceolate, 125 in. long. Corolla white (not seen). Capsule linear, acuminate, 1.5 in. long, pubescent.

Johore: at Gunong Panti, King's Collector 209.

15. Didymocarpus malayana, Hook. f. in Gard. Chron. II. 123, fig. 24 (1896). Stem very short, up to 3 in. long. Leaves ovate obtuse shortly petioled to lanceolate acute, long-petioled; 7 in. long, 2·75 in. broad; main nerves 15 pairs, conspicuous, silky-hairy. Peduncles stout, silky-hairy, 3 to 4 in. long, scapose with 2 flowers at the top or with 2 erect branches 3 in. long bearing 8 or 9 flowers each; flowers nodding. Calyx-lobes linear, obtuse, pubescent, long. Corolla 2 in. long, bright yellow; tube narrowed at the base, gibbous, inflated above, hairy; lobes rounded, subequal. Stamens 2; filaments included, curved, glabrous; anthers shield-shaped with 2 projecting horns on each; staminodes minute, tooth-like. Ovary conic, hairy; style long, glandular-pubescent; stigma capitate. Disk cylindric. Capsule cylindric, 1 to 1·5 in. long. Bot. Mag. t. 7526; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 38.

PERAK: Bujong Malacca, Curtis 3300, Ridley 9778; Tanjong Malim, Baldwin; Chabong, Scortechini 189; Ulu Bubong and Ulu Kirling, King's Collector 8799?, 10197? SELANGOR: Gunong Semangko, Curtis 3300; Bukit Kutu, Ridley 7580; Ginting Bidai, Ridley 7581. Usually at 1500 to 3000 ft. alt.

16. Didymocarpus albomarginata, Hemsley in Journ. Bot. XXV. 204 (1887). Stem 6 to 12 in. tall, pubescent, red. Leaves elliptic or ovate, obtuse, with a broad or cuneate base, dark green; edges and nerves white, sparsely hairy above, silky beneath; nerves about 10 pairs; 3 to 4 in. long, 1 to 1.5 in. wide. Peduncles axillary and subterminal, hairy, pink, 3 in. long, racemose or sparingly branched. Calyx-lobes lanceolate, hairy. Corolla yellow; tube narrow, pinkish white, dilated upwards; lobes subequal, rounded. Stamens 2; filaments thickened at the base, curved; anthers reniform with short processes; staminodes 2, filiform, hooked. Ovary cylindric, conic, pubescent; style long; stigma wide, discoid. Capsule cylindric, acuminate, rather thick; tip upcurved, hairy, '75 in. long. Ridley in Journ. Linn. Soc. XXXII. 506, and in Journ. Str. Br. R. As. Soc. No. 43, 39.

Perak: Larút Hills, 3000 to 5000 ft., Wray; Curtis 2039, 2991; Ridley 2908; King's Collector 1817.

A species closely allied to D. malayana, and difficult to distinguish from it in dried specimens except from the much smaller flowers.

17. Didymocarpus flavobrunnea, Ridley in Trans. Linn. Soc. Ser. 2, III. 329 (1893). Stem slender, seldom branched, densely pubescent, 3 to 4 in. tall. Leaves alternate; ovate lanceolate, acute; base unequal narrowed; margins serrate; 7 in. long, 3 in. wide; nerves and midrib beneath covered with shining brown hairs, above sparingly pubescent. Peduncles 8 in. long, stiff, hispid, branched shortly dichotomously above; branches short, crowded; flowers numerous, small; bracts lanceolate, acuminate, 25 in. long, hispid; pedicels short. Calyx-lobes linear, narrow, pubescent. Corolla 1 in. long; tube cylindric, gradually dilated towards the lips; lobes unequal, rounded, short; tube brownish outside; limb yellow with an orange spot in the mouth and some red streaks. Stamens 2, with filiform filaments. Ovary elliptic. Capsule 1 in. long, narrowed gradually from the base, splitting above nearly to the apex, glabrous. Journ. Str. Br. R. As. Soc. No. 43, 39.

Pahang: Tahan River woods, Ridley 2163.

The fruits crowded at the top of the peduncle radiating in all directions give this species the appearance of a Parabæa.

18. Didymocarpus longipes, Clarke in DC. Monog. Phan. V. i. 86 (1883). Stem woody, 2 in. long, hairy at the top. Leaves oblanceolate, narrowed to the base; obscurely serrate; glabrous and deep green above, hairy on the midrib and purple beneath; 8 in. long, 2·25 in. broad. Flowers few, racemose (occasionally panicled), pendent on peduncles 9 to 18 in. long, rather stout, purple. Calyx-lobes linear, acuminate, pubescent, purple, ·125 in. long. Corolla 1·5 in. long, pale yellow, pubescent; tube straight, little dilated upwards; upper two lobes short, rounded; lower longer, oblong. Stamens 2; filaments short, thick, adnate to the tube near the mouth; anthers reniform, connate, just included, with 2 short appressed horn-like processes to the connective. Ovary elongate, conic, passing into the terete style; stigma discoid. Disk cylindric. Capsule 1·25 in. long, rather thick, splitting along the upper edge. Clarke in Hook. f. Fl. Br. Ind. IV. 351; Ridley in Journ. Linn. Soc. XXXII. 509, and in Journ. Str. Br. R. As. Soc. No. 43, 40.

MALACCA: Mount Ophir, Griffith (K.D.) 3854; Cuming 2385; Maingay (K.D.) 2723; Ridley 3179.

19. DIDYMOCARPUS INÆQUALIS, Ridley in Journ. Linn. Soc. XXXII. 506 (1883). Stem woody, 5 in. or more tall, 125 in. thick, brown-

pubescent. Leaves alternate, distant, lanceolate, inæquilateral, acute, serrate, narrowed to the base; velvety above, pubescent beneath; 5 in. long, 1·5 in. wide or smaller; petiole distinct, pubescent, '5 in. long. Peduncles from the upper axils 1·5 in. long, pubescent; flowers crowded, pedicellate; bract linear, nearly '25 in. long. Calyx campanulate; lobes not free to the base, linear, '125 in. long, pubescent. Corolla blue, 1 in. long; tube slender, enlarged upwards; lobes short, rounded; filaments long slender. Ovary elongate cylindric; stigma obconic. Capsule cylindric, glabrous, 1·5 in. long. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 41.

Kedah: on Lankawi Island at Gunong Chinchang, Curtis 2568. 20. Didymocarpus alba, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 41 (1905). Stem woody, creeping, ascending, hairy-pubescent. Leaves crowded towards the top; lanceolate, acute at base; 2 in. long, 25 to 5 in. wide, softly densely hairy on both sides; petiole densely hairy, 5 in. long. Peduncles short, 5 in. or less long, 1-flowered, densely hairy. Calyx-lobes free to base, linear, acuminate, long-hairy, 125 in. long. Corolla quite white, 5 in. long, base cylindric, gradually dilated upwards, hairy; lobes short, rounded, subequal. Stamens 2; filaments rather short, filiform; staminodes 3, filiform, clubbed, shorter. Ovary pubescent. Capsule 75 in. long, curved, acuminate, splitting along the upper surface, glabrous.

Perak: at Bujong Malacca, Curtis 3299; Ridley 9780; Scortechini. Var. major, Ridley. Stems taller, over 1 ft. high. Leaves more remote and less hairy. Peduncles longer, 1 in. in flower, 1.25 in. in fruit. Corolla 1 in. long.

Perak: at Gunong Bubu, 4500 ft., Wray 3209.

Sect. III. REPTANTES.

21. Didymocarpus reptans, Jack in Mal. Misc. I. pt. ii. 3 (1820), and in Trans. Linn. Soc. XIV. 35. Stems creeping, 6 in. or more long, villous. Leaves opposite; ovate or elliptic, blunt at apex, narrowed or rounded at base; upper surface sprinkled with villous hairs, lower more hairy; margins obscurely crenulate; '75 to 3 in. long, '5 to '75 in. broad. Peduncles slender, subterminal, 1-flowered, hairy, 1 in. long; bract very small; pedicel '25 in. long. Calyx-lobes linear, villous, '125 in. long. Corolla '5 in. long, pubescent, white with purple and yellow streaks in the mouth; tube trumpet-shaped; lobes rather large, rounded. Stamens 2; filaments far included, filiform; staminodes very short. Ovary cylindric; style slender; stigma discoid. Capsule 1 in. long, slender, scabrid, splitting nearly to the apex. Calc. Journ. Nat. Hist. IV. 55; Spreng.

Syst. II. 837; Wall. Cat. 787; G. Don Gen. Syst. Dichl. Pl. IV. 659; R. Br. in Benn. Pl. Jav. Rar. 119, and Am. Sc. Nat. 2, XIII. 164; DC. Prodr. IX. 286; Miq. Fl. Ind. Bat. II. 726; Clarke in DC. Monog. Phan. V. i. 95, and in Hook. f. Fl. Br. Ind. IV. 352; Ridley in Journ. Linn. Soc. XXXII. 511, and in Journ. Str. Br. R. As. Soc. No. 43, 42. Henckelia reptans, Spreng. Syst. curæ post. 14.

Penang: Wallich 787; Maingay (K.D.) 1223; Lobb 335; at Pulau Betong, Curtis 1706; Penang Hill, G. King. Selangor: Bukit Kutu, Ridley 7585.

Var. monticola, Ridley. More slender, and creeping for 1.5 ft. or more; the shoots covered with rufous hairs. Leaves narrower, lanceolate, acute, narrowed into the petiole; 2 to 3 in. long, 3 to 5 in. broad. D.? producta, Clarke in DC. Monog. Phan. V. i. 96.

PERAK: Gunong Batu Putih, Wray 480, 927; Larút Hills Curtis 2040, 2992; Ridley 2912; Scortechini 20, 257; Goping, King's Collector 1099. Dindings: Simpit, near Lumut, Ridley 3062. Selangor: Pahang track, Ridley 8561; Ginting Bidai, Ridley 7586. Negri Sembilan: Bukit Tamiang and Bukit Sulu, Cantley's Collector.—Distrib. Sumatra (Horsfield).

Var. violascens, Ridley. Stems ascending for 1 ft. or so. Leaves rather remote, nearly glabrous above except for dense hair on the margins and midrib, more hairy beneath; nerves elevated, densely appressed-hairy. Flowers purplish-white.

Selangor: Rawang, Ridley 7583; Dusun Tera, Ridley 7584.

22. Didymocarpus ophirensis, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 43 (1905). Stem creeping, over 1 ft. long. Leaves opposite, somewhat unequal, elliptic; dark green with white on the nerves, 1 to 3 in. long, 5 to 1 in. wide, base rounded; above sprinkled with short hairs, beneath paler, more hairy; margins entire, thickly hairy; nerves 5 to 6 pairs, densely hairy; petiole 25 in. long, hairy. Peduncles subterminal, 1 in. long, hairy. Calyx-lobes linear, 125 in. long, densely hairy. Corolla 75 in. long, gradually dilated forwards, rather broad at the top, hairy, purple and white; upper lip much shorter than lower one. Stamens filiform, little shorter than the corolla. Style slender; stigma capitate. Capsule cylindric, hairy, 1 in. long.

MALACCA: lower part of Mount Ophir, Ridley 3185.

Ridley says: "I took this at first to be *D. marginata*, Clarke in DC. Monog. Phan. V. i. 96, and in Hook. f. Fl. Br. Ind. IV. 352, which was based on a plant collected in Malacca or Luzon by Lobb, but which, from the description, may be a form of *D. reptans*, and the locality of which is doubtful."

23. DIDYMOCARPUS PULCHELLA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 44 (1905). Stems slender, 3 to 6 in. long, purple, covered with

appressed hairs. Leaves opposite, elliptic, obtuse, 1 to 2 in. long; dark green above with a central white stripe, dotted with short hairs; beneath purple, sprinkled with hairs; the nerves and edges hairy; petiole ·25 to ·5 in. long, hairy. Peduncles axillary, 1 in. long, slender, hairy; bract linear, very small; pedicel ·5 in. long, slender, hairy. Calyx-lobes narrowed, linear, ·125 in. long, hairy. Corolla white, with yellow in the mouth, nearly 1 in. long; tube cylindric, hardly dilated, sparingly hairy; lobes oblong, rounded. Stamens 2 fertile; filaments filiform, straight; anthers oblong. Ovary slender, cylindric, pubescent, with style ·4 in. long. Capsule narrow, cylindric, upcurved, 1·5 in. long, pubescent.

Pahang: Kwala Lipis, Machado 11629.

24. Didymocarpus crocea, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 44 (1905). Stems succulent, creeping, pubescent, 1 ft. or more long. Leaves opposite but unequal; ovate, obtuse; surface softly hairy, green with white veins; 1 to 3 in. long, '75 to 1.25 in. broad; nerves raised beneath; petiole '5 in. long or less. Peduncles subterminal, 1 to 3 in. long, 1-flowered, softly hairy; bracts 2, short, linear. Calyx-lobes linear, pubescent, '15 to '2 in. long. Corolla orange-yellow, pubescent, bilabiate, 2 in. long; tube narrowed at the base, dilated, gibbous above; lobes rounded, darker orange; lower lip longer than upper. Stamens 2; filaments sinuate; anthers with 2 processes each on the back; staminodes filiform, hooked. Style slender; stigma capitate. Capsule rather thick, curved upwards, 1.25 in. long, pubescent.

PERAK: Gunong Keledang, on banks, Ridley 9776; Curtis 3301; Sungkei, King's Collector 3014.

25. Didymocarpus ascendens, Ridley in Journ. Linn. Soc. XXXII. 512 (1896). Stem rather slender, creeping, ascending, branched above, 4 to 8 in. high; branches 2 in. long or more. Leaves crowded above, opposite, subequal; ovate, subacute, narrowed or broad at base, entire; surface dark green, silky-hairy, the edges white-silky; 1.5 to 2 in. long, 5 to 1 in. broad; petiole 1 in. long or less. Flowers solitary on hairy peduncles .5 to 1 in. long. Calyx-lobes linear, acuminate, silky. Corolla orange-yellow, 1.5 in. long, narrow cylindric, dilated above, pubescent; lobes short, rounded, subequal. Stamens 2; filaments long, thick; anthers triangular, obtuse. Ovary cylindric, pubescent; style long; stigma ovate, triangular. Capsule cylindric, acuminate, 1 in. long. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 45.

Perak: Tapa, Haviland; Curtis 3106; Goping, King's Collector 458.

Sect. IV. HETEROBÆA.

26. Didymocarpus rugosa, Bidley in Journ. Str. Br. R. As. Soc. No. 43,

45 (1905). Stem short, stout, woody, 2 to 3 in. long. Leaves crowded at the top, rather thick; oblong, oblanceolate, winged to the base; dentate; glabrous and strongly bullate, wrinkled above, beneath pubescent with midrib and nerves hairy; nerves very numerous and close (about 40 pairs), nervules transverse, strongly raised; 3 to 5 in. long, 1.5 to 2 in. wide. Peduncles slender, 3 in. long, hairy, ebracteate; flowers solitary. Calyx-lobes short, ovate acute. Corolla-tube trumpetshaped, 1 in. long; lower lip longer than the upper; lobes broad, white with yellow central bar. Stamens 2; anthers narrow; connective 2-horned; staminodes short, very slender, hooked. Ovary and style very hairy; stigma broad, reniform.

Perak: Hulu Selama, Scortechini 1273. Kelantan: Kwala Lebir, Dr. Gimlette.

27. Didymocarpus platypus, Clarke in DC. Monog. Phan. V. i. 94 (1883), and in Hook. f. Fl. Br. Ind. IV. 352 (1884). Stem woody below, pubescent, leafy above, 4 to 22 in. long. Leaves sessile, alternate; oblanceolate, 8 to 13 in. long, 3 in. wide; margins serrate; above sprinkled with multicellular hairs from a swollen base, beneath glabrous except for the elevated nerves and reticulations, densely appressed hairy. Peduncles numerous, axillary, 1 in. long, slender, hairy; bracts 2, short, lanceolate, hairy; pedicel 1-flowered, 5 in. long, hairy. Calyx-lobes ovate, obtuse, hairy, 1 in long. Corolla from a narrow base dilated forwards, 1.25 in. long, sparingly hairy, white with a yellow mouth; lobes broad, rounded. Stamens 2; filaments filiform, long; anthers reniform, with a process of the connective projecting beyond them. Style long, slender; stigma wide, discoid. Capsulė cylindric, 1.5 in. long, pubescent. Ridley in Journ. Linn. Soc. XXXII. 505, and in Journ. Str. Br. R. As. Soc. No. 43, 46.

Perak: Gunong Batu Putih, Wray 934; Goping, King's Collector 832. Selangor: Klang, Beccari 5; Kuala Lumpur, Ridley. Negri Sembilan: Perhentian Tinggi, Ridley 10097; Bukit Temiang, Cantley. Malacca: Griffith (K.D.) 3825; Maingay (K.D.) 1226; Cuming 2359; Ayer Panas, Derry 111; Harvey. Johore: Ulu Batu Pahat, Kelsall; Gunong Pulai, Ridley 3729. Singapore: Bukit Timah, Selitar, Ridley.—Distrib. Sumatra.

28. Didymocarpus Kompsobæa, Clarke in DC. Monog. Phan. V. i. 92, t. 10 (1883). Stem woody, 4 to 5 in. tall. Leaves crowded at the top; oblanceolate, acute, narrowed towards the base; 5 to 9 in. long, 2 to 3 in. wide; margins coarsely crenate-dentate; above glabrous when adult, with a few multicellular hairs when young; beneath minutely pubescent; nerves and reticulations elevated; midrib and main nerves with long brownish appressed hairs. Peduncles 1-flowered, 4 in. long,

hairy. Calyx-lobes ovate, hairy, 125 in. long. Corolla white with yellow in the throat; tube 1 in. long; base narrowed, above somewhat abruptly swollen, nearly glabrous; lower lip longer than the upper one. Stamens 2; filaments filiform; anthers oblong. Capsule 1.75 in. long, moderately thick, pubescent. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 44.

Pahang: Tahan River Woods, Ridley 2152. Selangon: Bukit Hitam, Kelsall.

29. Didymocarpus quinquevulnera, Ridley in Trans. Linn. Soc. Ser. 2, III. 328 (1893). Stem woody, 6 to 9 in. tall or less, covered with brown wool. Leaves lanceolate, acuminate, acute, serrate, narrowed to the base; silky pubescent, dark green; 6 in. long, 2 to 2·5 in. wide. Peduncles slender, rosy, white-ciliate; flowers numerous. Calyxlobes lanceolate, acute. Corolla-tube slender, dilated forwards, 3 in. long, white, 2-lipped; lobes rounded, crimson or violet-purple edged with white, with yellow streaks in the throat. Stamens rather thick, sinuate, white; anthers reniform. Ovary cylindric, pubescent; stigma cordate. Capsule cylindric, acuminate, 3·5 in. long. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 47.

Pahang: Kota Glanggi, Tahan Woods, Ridley 2144, 2154. Selangor: Pahang Track, 15th mile, Ridley 8559.

30. DIDYMOCARPUS ATROSANGUINEA, Ridley in Trans. Linn. Soc. Ser. 2, III. 328 (1893). Stem woody, 6 in. high, '25 in. thick. Leaves lanceolate, acute, crenulate, denticulate or dentate, base broad; 9 in. long, 4 in. wide; deep green velvety pubescent above, glaucescent, pubescent beneath with elevated nerves and nervules. Peduncles 3 in. long, pubescent; bracts ovate. Calyx-lobes linear, acute, '25 in. long, pubescent, red. Corolla pubescent, deep red, yellow in the mouth; tube 2 in. long, dilated upwards; lobes subequal, ovate obtuse. Stamens 2; filaments sinuous, rather thick; anthers semi-ovate. Style longer than the stamens, pubescent; stigma rounded. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 47.

PAHANG: Tahan Woods, Ridley. TRINGGANU: Ridley.

31. Didymocarpus hirsuta, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 48 (1905). Stem woody, over 1 ft. long, branched, densely hairy above with long multicellular hairs. Leaves alternate, lanceolate acuminate, narrowed to the base, crenate, densely hairy on both surfaces; 6 in. long, 1.5 in. wide; petiole .5 in. long or less. Flowers solitary on the peduncles in the lower and upper axils. Peduncles very slender, hairy, 1 in. long. Calyx-lobes short, ovate lanceolate, obtuse. Corolla narrow, 1.5 in. long, yellow, pubescent. Capsule very narrow, cylindric, pubescent, 3 in. long.

Perak: Goping, King's Collector 715; Larút Hills, King's Collector 2529.

32. Didymocarpus Bombycina, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 32 (1905). Stem branched, woody, 3 to 4 ft. tall; above closely silky pubescent. Leaves lanceolate acuminate; 4 to 6 in. long, 1 in. across; narrowed to the base; minutely crenulate; densely silky pubescent on both sides; nerves very numerous and close. Pedicels short, 1 in. long, slender, silky. Calyx-lobes ovate, acute, small, silky. Corolla-tube 1 in. long, sparingly pubescent, white tinged with pink or blue, trumpet-shaped.

PERAK: Ulu Bubong, 400 to 600 ft., King's Collector 10587.

33. DIDYMOCARPUS CRINITA, Jack in Mal. Misc. I. II. 1 (1820), and in Trans. Linn. Soc. XIV. 33, t. 2, fig. 2 (1823). Stem woody, pubescent, 6 in. tall. Leaves narrow, lanceolate acute, narrowed to the base; shortly and closely serrate; 6 in. long, 1 in. wide; dark green above, sometimes with a white longitudinal bar, covered closely with short velvety hair; beneath purple with longer hair especially on the nerves. Peduncles about 1 in. long, villous; pedicels 25 in. long; bracts linear, all villous. Calyx-lobes narrow, lanceolate acute, villous, 125 in. long. Corolla white or usually pale blue, 1.5 in. long, pubescent; tube narrowed at the base, dilated forwards; lobes large, rounded, subequal. Stamens: filaments filiform, curved; anthers oblong with short lateral processes. Style and ovary cylindric, pubescent; stigma discoid. Capsule slender, cylindric, 2 to 3 in. long, pubescent. Calc. Journ. Nat. Hist. IV. 53, t. 15, fig. 2; Wall. Cat. 779; Spreng. Syst. II. 837; G. Don Gen. Syst. Dichl. Pl. IV. 659; R. Br. in Benn. Pl. Jav. Rar. 118, and in Ann. Sc. Nat. 2, XIII. 164; DC. Prodr. IX. 265; Hook. Bot. Mag. t. 4554; Fl. des Serres, t. 631; Lem. Jard. Fl. t. 87; Mig. Fl. Ind. Bat. II. 724; Clarke in DC. Monog. Phan. V. i. 93, and in Hook. f. Fl. Br. Ind. IV. 351; Ridley in Journ. Linn. Soc. XXXII. 505, and in Journ. Str. Br. R. As. Soc. No. 43, 49. Henckelia crinita, Spreng. Syst. curæ post. 13.

Kedah: Gunong Jerai, Ridley; Tomoh, Machado. Kelantan: Kwala Lebir, Dr. Gimlette. Penang: Wallich; Helfer 3834; Gaudichaud 71; West Hill, Curtis 410; Stoliczka; G. King; Deschamps. Perak: Larút Hills, Scortechini 10294; Ridley 2907; King's Collector 2157; Tapa, Curtis 3781. Selangor: Ginting Bidai, Ridley 7577. Sungei Ujong: Bukit Sulu, Cantley. Pahang: Raub Track, Machado 11575; Tahan Woods, Ridley 2169. Malacca: Maingay (K.D.) 1225; Harvey. Singapore: Walker 18; Lobb 311.— Distrib. Sumatra, Borneo.

VAR. Curtisii, Ridley. Leaves oblanceolate, acute, serrate, deep green

with a silvery central bar, covered with long multicellular hairs from a swollen base on both sides, very dense and longer on the back at the base and on the buds. Scapes 3 in. long, hairy, slender. Calyx-lobes oblong, hairy, blunt. Corolla 2 in. long, blue; tube hairy, swollen upwards; lobes unequal, 1 in. across the limb. Stigma broad, heart-shaped.

SELANGOR: near the Gap, Curtis.

VAR. elongata, Ridley. Stem tall and somewhat branched. Leaves scattered, narrow and small; 3 in. long, 5 in. wide, hairy. Flowers small, pale blue, 1 in. long, on slender pedicels 3 in. long or less, from the lower as well as from the upper axils.

PERAK: Tapah, Curtis 3781.

34. Didymocarpus fasciata, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 50 (1905), Stem woody, 6 to 8 in. tall, with soft hair in the upper parts. Leaves alternate, narrowly lanceolate, acuminate, narrowed to base; 4 to 8 in. long, 1.5 in. wide; margins serrulate crenulate; above deep velvety malachite green, with a broad central white bar covered with short scattered hairs; back, edges, and petiole with longer pale silky hairs. Peduncles slender, short, 1.5 in. long, hairy; bract very small, linear. Calyx-lobes narrow, lanceolate, very small. Corolla 1.5 in. long, cylindric, trumpet-shaped; white limb edged violet. Capsule very slender, 2 in. long or less, glabrous.

Kedah: Gunong Jerai, Ridley. Рананд: Tahan River, in rocky woods, Ridley 2169.—Distrib. Lingga, Batu Gajah (Hullett).

35. DIDYMOCARPUS VENUSTA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 51 (1905). Stem erect, woody, 12 to 18 in. tall. Leaves oblong lanceolate, subacute, crenulate-serrate, narrowed into the petiole, winged to the base; 4 to 6 in. long, 1 to 2 in. wide; nerves elevated on both surfaces, 22 pairs; glabrous above, nerves and midrib ferruginous hairy beneath. Peduncles axillary, 1 or 2 in an axil, 7 in. long, hairy; flowers terminal, 2, large, white; bracts 2, oblong cuspidate, glabrous, 3 to ·4 in. long; pedicels hairy, lower one ·25, upper one ·5 in. long. Calyxlobes free to base, linear acuminate, pubescent, 5 in. long. Corolla pubescent; tube enlarged upwards, infundibuliform, 1.5 in. long, pure white with a brown spot on the lower lobes; upper lobes shorter than lower, rounded; lower lip 5 in. long, lobes oblong. Stamens included. 2; filaments filiform; anthers oblong; staminodes filiform, hooked. Ovary narrow, cylindric, with style 5 in. long; all pubescent; stigma large, cordate. Capsule terete, acuminate, splitting along the upper edge, glabrous, 2 to 2.5 in. long.

PERAK: Bujong Malacca, Ridley. SELANGOR: Gunong Semangko, Curtis 3751.

Ridley says this beautiful plant hardly belongs to this group. It resembles much more closely a *Didissandra*, but has 2 stamens only.

Sect. V. SALICINÆ.

36. DIDYMOCARPUS DENSIFOLIA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 51 (1905). Stem woody, 3 in. tall. Leaves numerous, crowded, alternate; lanceolate, acuminate, narrowed to the base, rather thick in texture, entire, nearly glabrous when adult except for a few hairs on the midrib; 1.5 to 5 in. long, .25 to .75 in. wide. Peduncles hairy, slender, 3 in. long, with a few 1-flowered short branches; bracts linear, oblong. Calyx-lobes linear oblong, pubescent. Corolla not seen. Ovary cylindric, pubescent; style pubescent; stigma small, capitate. Capsule cylindric, pubescent, 1 in. long, splitting nearly to the tip.

Joнове: Gunong Janeng, Kelsall.

37. DIDYMOCARPUS SALICINA, Ridley in Trans. Linn. Soc. Ser. 2, III. 329 (1893). A small shrubby plant, 3 to 6 in. tall, simple or branched, glabrous below, pubescent above. Leaves numerous, crowded above, opposite; narrowly lanceolate, acuminate, glabrous, serrate; 3 to 4 in. long, 1.5 in. wide; pale green above, reddish beneath; petiole slender, 1.5 in. long or less. Peduncles numerous, crowded in the upper axils, very slender, glabrous, red, 2 in. long; branches few, divaricate, pubescent; flowers very small, 125 in. long, pink. Calyx-lobes very narrow, linear-pubescent. Corolla campanulate; lobes ovate acute. Stamens 2; filaments short, slender; anthers reniform. Style longer than the corolla, glabrous; stigma small, capitate. Capsule cylindric, acuminate, 75 in. long. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 52.

Pahang: Tahan River, Ridley 2166. On stream-banks in woods.

38. Didymocarpus serratifolia, Ridley. Stem woody, 6 in. long or less. Leaves numerous, lanceolate acute, narrowed at base, not petioled; strongly toothed; teeth '125 in. long, acute; nerves 40 pairs; 8 in. long, 1 in. wide; glabrous above, midrib with pale hairs beneath. Scape slender, hairy, 3 in. long; flowers 4 or 5, nearly sessile. Calyx-lobes ovate, short hairy. Corolla trumpet-shaped, '75 in. long, narrowed at base, dilated upwards; lower lip longer than upper one; '25 in. wide, 3-lobed, side lobes rounded, median longer, oblong; white stained with purple outside, yellow in the mouth. Capsule very slender, over 1 in. long, pubescent, pedicelled. D. serrata, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 52, not of R. Br.

Perak: Larut Hills on rocks in dense forest, below the Tea Gardens, at about 1000 ft. alt., Ridley 11922.

39. DIDYMOCARPUS PECTINATA, Clarke in Herb. Kew., ex Oliver in Ic. Pl. t. 2246 (1892). Small shrubby plant, 6 in. or more tall, branched or simple. Leaves densely crowded at the top, glabrous, deeply pectinate, 6 to 7 in. long; lobes '4 in. long, '125 in. wide at the base, blunt. Pedwncles from the upper axils several, pubescent, 2 in. long. Calyx "dark blue." Corolla white, tomentose, '3 in. long; tube cylindric, slightly inflated; upper lobe obovate, rounded. Stamens 2; filaments curved; anthers oblong; staminodes absent. Disk tubular. Capsule '5 to '75 in. long, pale, glabrous, rather thick, curved. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 53.

Perak: on limestone rocks at 400 to 800 ft. alt., King's Collector 10711. Selangor: Rawang, Ridley 7579; Kelsall 1981.

Sect. VI. ACAULES.

40. Didymocarpus violacea, Ridley in Journ. Linn. Soc. XXXII. 509 (1895). Rootstock short, erect; stem 1 in. long, densely woolly. Leaves numerous, very unequal, ovate to lanceolate, acute, narrowed at the base, oblique, toothed; densely softly hairy; 2 to 8 in. long, 1.25 to 2.5 in. wide; sessile or petioled; petiole as much as 2 in. long. Panicles 2 to 5 in. long, lax; branches slender, pubescent. Calyx-lobes oblong, lanceolate, .125 in. long, glabrous. Corolla-tube trumpet-shaped, curved, .5 in. long, violet; upper lobes short, recurved, lower ones .25 in. longer. Stamens 2; filaments filiform. Ovary long, terete; style short; stigma clubbed. Capsule glabrous, cylindric, .75 in. long.

PERAK: Hermitage Hill at 5000 ft. elevation, on rocks in the stream, Ridley 2909.

41. Didymocarpus lacunosa, Hook. f. Bot. Mag. t. 7236 (1892). Stemless. Leaves crowded, oblong or ovate, cordate, tomentose, crenulate, 2 to 4 in. long, 1.5 to 3 in. across; above pubescent, beneath rusty tomentose, especially on the elevated nerves; petiole 2 to 4 in. long, rusty tomentose. Scapes 4 to 6 in. long, 2-to many-flowered, simple or 3- or 4-branched at the top; branches 5 in. long; flowers nodding. Corolla 1 in. long, deep violet blue; tube narrow at the base, gibbous, inflated upwards; lobes short, rounded, subequal. Stamens included, curved, swollen near the base, narrowed upwards; anthers elliptic, not horned; staminodes filiform, one-third as long. Pistil linear, pubescent, gradually narrowed into the style; stigma very shortly bifid. Capsule 2 in. long, linear. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 54.

KEDAH: Lankawi island, at Terutau, on damp rocks, Curtis 1655.

42. Didymocarpus perdita, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 54 (1905). Stem creeping, woody, about 4 in. long. Leaves elliptic obtuse, rounded, peltate; margins crenulate; 3 in. long, 1.5 in. wide; above scabrid and sprinkled over with hairs, beneath glabrous except for the midrib and nerves, which are hairy with appressed hairs; margin with hairs on the crenulations; petiole 1 to 2 in. long, hairy. Peduncles slender, 4 in. long, subterminal, hairy. Calyx-lobes lanceolate, pubescent. Corolla not seen. Capsule ·5 in. long, narrowed suddenly into the style and only splitting as far as the base of the style; stigma subbilobed, large.

SINGAPORE: Selitar, very rare, Ridley.

Ridley found two plants of this together in a small ravine near Selitar in 1889, one in fruit. Since then the locality has been destroyed by cultivation, and the plant has disappeared and is probably extinct.

43. Didymocarpus puncticulata, Ridley in Journ. Linn. Soc. XXXII. 510 (1895). Almost stemless. Leaves crowded, elliptic or obcuneate or nearly oblanceolate, inequilateral, base truncate; crenate, puncticulate, hispid; 3 in. long, 1.5 in. wide or smaller; nerves beneath elevated, hairy. Peduncles subterminal, 3 in. long, slender, thickening in fruit, hairy. Calyx-lobes lanceolate, acute, .06 in. long, hairy. Corolla .25 in. long, hairy, violet; tube short, broad campanulate; lower lip longer than the upper one; lobes oblong obtuse. Stamens very short; filaments thick; anthers large, conic, shield-shaped; style longer, pubescent. Capsule .5 in. long, thick, hispid.

JOHORE: Gunong Panti, Ridley.

44. Didymocarpus heterophylla, Ridley in Trans. Linn. Soc. Ser. 2, III., 329 (1893). Stem short with a long woody root, woolly above. Leaves crowded, very variable in size, obovate, oblique or lanceolate, crenulate, obtuse; 4 in. long, 1.5 in. wide or less; above dark green, purplish in the centre, glabrous, beneath reddish; nerves raised, covered with red wool on the back. Peduncles slender, hairy, 3 in. long; branches short and few; flowers few, small. Calyx-lobes linear, pubescent, 125 in. long. Corolla campanulate, 25 in. long, violet, pubescent. Style longer, pubescent. Capsule cylindric, curved, acuminate, 1 in. long, glabrous, splitting for nearly the whole length. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 56.

Pahang: Tahan River, Ridley 2170. Johore: Gunong Janeng, Kelsall.

45. DIDYMOCARPUS PUMILA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 56 (1905). Stem slender, woody, 1 to 3 in. long. Leaves crowded at the top, elliptic obovate, obtuse, narrowed at the base and

inæquilateral; ·5 to 1·5 in. long, ·25 to 1 in. wide; above silky pubescent, beneath dotted with swollen hair-bases; nerves about 6 pairs, elevated, hairy with appressed hairs. Peduncles slender, erect, purple, with silky appressed white hairs, 2 to 3 in. tall, subterminal; flowers 1 to 2, terminal, very shortly pedicelled; bract linear, purple. Calyx-lobes linear, purple, pubescent. Corolla ·25 in. long, with a short broad tube, pubescent, purplish-white, hardly bilabiate; lobes rounded, pinkish white. Stamens 2; filaments slender, short, filiform. Ovary slender, cylindric; style longer than stamens; stigma discoid. Capsule ·75 in. long, terete, upcurved, splitting along the upper edge, minutely pubescent.

Selangon: the Gap—Semangko Pass, alt. 3000 ft., Curtis 3782; Burn-Murdoch.

AFFINITY DOUBTFUL.

46. Didymocarpus lilacina, Ridley in Trans. Linn. Soc. Ser. 2, III. 330 (1893). Stem 12 to 15 in. long, entirely leafy, brown-pubescent. Leaves alternate, spreading, lanceolate, crenate dentate, pubescent, dark green; 4 in. long, 1 in. wide; petiole 1 in. long. Pedicels numerous, rising from the petiole near the leaf-blade, slender, '25 in. long, pubescent. Calyx-lobes very short, lanceolate, hispid. Corolla campanulate, rosy-violet, sparingly pubescent; lobes oblong, rounded. Stamens 2; filaments thick, with slender base; anthers reniform. Style shorter than the corolla, pubescent; stigma capitate. Capsule '65 in. long, rather thick, cylindric, with a short beak. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 57.

Pahang: Tahan River, Ridley 2165.

5. CHIRITA, Buch.—Ham.

Herbs or slender shrubs. Leaves opposite, often unequal or whorled or alternate; elliptic or ovate. Peduncles axillary, 1- or more flowered; bracts free or connate, small or large. Calyx 5-lobed, with acute lobes, usually large. Corolla infundibuliform or tubular-ventricose, blue or white, 2-lipped; lobes rounded. Stamens 2; filaments filiform, geniculate; anthers rounded, connivent, often hairy. Disk annular. Ovary cylindric, linear; style usually long; stigma ovate or narrow, bifid. Capsule long, cylindric.—Distrib. Species about 26, in India, China, and Malaya.

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Bracts free:-
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Leaves ovate :-

Corolla 1.5 in. long, azure blue; stems 1 ft. high or more.. 2. C. caliginosa. Corolla .75 in. long, violet with darker streaks; stems

under 1 ft. high 3. C. viola.

Leaves lanceolate; corolla blue, rarely white .. 4. C. sericea.

Bracts connate; leaves ovate; corolla blue or violet:-

Corolla-tube 5 in. long 5. C. rupestris.

Corolla-tube 1 in. long 6. C. Glasgovii.

Doubtful Species.
7. C. mollissima.

1. Chirita elata, Ridley in Journ. Linn. Soc. XXXII. 518 (1895). A tall rough herb, 2 ft. high. Stem angled, branched. Leaves 3 to 6 in. long, 1.5 to 3 in. wide, ovate, inæquilateral, acute, toothed; with elevated nerves, hispid; petioles slender, 1 in. long. Cymes lateral, axillary, 3 in. long, hispid. Calyx-lobes lanceolate acuminate, hairy, 125 in. long. Corolla funnel-shaped, hairy, 1 in. long, claret colour; lobes short, rounded, subequal, 5 in. across. Stamens 2; filaments slender; anthers oblong; staminodes short, with abortive anthers. Ovary short, pubescent; stigma peltate. sub-bilobed. Capsule straight, cylindric. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 57.

Perak: Larut Hills, Wray 2985; Curtis 2038; Ridley 2911.

2. Chirita caliginosa, Clarke in DC. Monog. Phan. V. i. 122 (1883). A soft herb, 1 ft. or more tall, often branched. Leaves opposite; ovate acuminate, base broad or cuneate, very inæquilateral; margins entire or slightly toothed; 2.5 in. long, 1 to 2 in. wide; closely pubescent; petiole 5 in. long. Flowers several, axillary; pedicels 5 to 1 in. long, pubescent. Calyx-lobes lanceolate acuminate, hairy, 5 in. long. Corolla 1.5 in. long, azure blue; tube narrow at the base, broadly infundibuliform at the apex, pubescent; lobes large, rounded, 75 in. across the lips. Stamens 2; anthers globose, covered with long hairs at base. Style slender, pubescent; stigma bilobed, lobes linear. Capsule 3 in. long, slender, cylindric, curved. Clarke in Hook. f. Fl. Br. Ind. IV. 360; Ridley in Journ. Linn. Soc. XXXII. 516, and in Journ. Str. Br. R. As. Soc. No. 43, 58.

PERAK: Kuala Dipang, Curtis 3109; Batu Kuran, Scortechini 1582 Selangor: Kuala Lumpur caves, Beccari; Curtis 2359.

3. Chirita viola, Ridley in Journ. Linn. Soc. XXXII. 516 (1895). A herb, 2 to 10 in. tall, pubescent. Leaves ovate acute, crenate or serrate or entire, very unequal, 2 to 6 in. long, 1.5 to 3 in. wide; petiole ·125 in. long. Cymes short, few-flowered; flowers small; pedicels ·5 in. long. Calyx-lobes lanceolate, acute, hispid, nearly ·125 in. long. Corolla ·75 in. long, violet; tube narrow at the base, thin, dilated,

trumpet-shaped; upper lobes short, rounded, lower ones ovate obtuse, longer, median one longest, elliptic, all violet with darker streaks and a patch of yellow glandular hairs in the mouth. Stamens 2, exsert; anthers yellow, ovoid, with a thickened connective, ciliate at the base, with a black spot on each anther; filaments attached to the mouth of the tube. Ovary pubescent; stigma obliquely bifid; lobes linear, obtuse. Capsule terete, acute, 1.5 in. long, minutely pubescent. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 59.

Kedah: Lankawi Islands, Curtis 2570.—Distrib. S. Siam, on limestone rocks.

4. Chirita sericea, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 59 (1905). Herb, 3 to 6 in. tall, simple or branched, woolly. Leaves alternate, lanceolate, acute or acuminate, base unequal, cuneate; 2 to 3 in. long, 5 in. wide; margins entire; both sides densely covered with short silky hairs; petiole 25 to 1 in. long. Flowers 1 to 2, axillary; pedicels 5 in. or less, silky-hairy, ebracteolate. Calyx-lobes narrow, linear acuminate, densely silky-hairy. Corolla blue, rarely white; tube half as long again as sepals; lobes broader, unequal, oblong, all hairy. Style slender, glabrous; stigma bilobed, lobes elliptic. Capsule cylindric, 1.5 in. long, silky-hairy.

PERAK: Ipoh, limestone rocks, Curtis 3131.

VAR. Scortechinii, Ridley, l.c.

Capsule shorter, 5 in. long, and thicker, 125 in. through, splitting longitudinally into 2 valves. Corolla-tube straight; lobes of lower lip broad.

Perak: Scortechini 102, 112.

5. Chirita rupestris, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 59 (1905). A herb, about 4 to 10 in. tall. Stem simple or branched, glabrescent. Leaves opposite or alternate, thin, ovate obtuse; 1 to 3 in. long, 5 to 2.5 in. wide; above sprinkled with multicellular hairs. Flowers axillary, 1 to 2, sessile, on a peduncle 5 in. long, hairy, enclosed in a green cupular bilobed bract 5 in. long; edges recurved and covered with multicellular hairs. Calyx-lobes narrowly lanceolate, hairy, nearly 5 in. long. Corolla-tube as long as the bract, hairy, blue, little longer than the calyx-lobes, rounded. Ovary and style slender, hairy. Capsule cylindric, slender, curved, 2.5 in. long.

Kedah: Lankawi, on damp rocks, Curtis 2120.

6. Chirita Glasgovii, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 60 (1905). A weak herb, 1 ft. tall, branched. *Leaves* ovate obtuse, thin; 1 to 3 in. long, 75 to 2 in. wide; base rounded, retuse; nerves 5 pairs, alternate; above sprinkled with multicellular hairs, beneath paler with a few hairs on the nerves, otherwise nearly glabrous; petiole

slender, 1 to 2 in. long, glabrous. Bract convolute, bilobed; lobes ovate, hairy, 1 in. long. Calyx-lobes lanceolate acuminate, narrow, hairy, 5 in. long. Corolla-tube 1 in. long, minutely hairy, dark violet. Capsule cylindric, curved, 3 in. long, glabrous.

PERAK: Waterloo near Kuala Kangsa, C. Robertson-Glasgow.

DOUBTFUL SPECIES.

7. Chirita mollissima, Ridley in Journ. Linn. Soc. XXXII. 517 (1895). Nearly stemless. Leaves congested, lanceolate, acute, obscurely minutely serrate, silvery-tomentose; 6 to 8 in. long, 1·25 to 2 in. broad. Flowers pedicelled, drooping, axillary, few, handsome; pedicels somewhat thick, woolly, 1 in. long. Calyx-lobes lanceolate, acuminate, equal, 5 in. long, tomentose. Corolla funnel-shaped, more than 1 in. long, oblong, obtuse; the upper lobes short, rounded, violet, the lower wider; the tube white in the throat, with glandular hairs above the anthers. Stamens 2; filaments broad, curved; anthers broad, thick. Pistil pubescent, emerald green, little exsert; the ovary cylindric, attenuated in the style; stigma 2-lobed, pubescent, decurved. Capsule 1 in. long, broad, thick, glabrous or pubescent.

SIAMESE STATES: Pangah, Curtis 2944.

6. Tetraphyllum, Griff.

Undershrubs; stem elongate, with leaves crowded towards the apex. Leaves opposite or in whorls of 4, nearly sessile, ovate, unequal-sided. Cymes capitate or lax from the axils of the upper leaves; bracts elliptic, oblong or lanceolate. Calyx somewhat large, 5-partite, obscurely 2-lipped. Corolla widely funnel-shaped, more or less 2-lipped; lobes 5, subequal, ovate. Stamens 2, fertile; filaments short, filiform, often spirally twisted; anthers 2-celled; apex submucronate; cells oblong or ellipsoid, parallel or divergent; staminodes very minute. Ovary ellipsoid, acute; style linear; stigma small, capitate, sub-bilobed; placentæ parietal, 2-lamellate; ovules very numerous. Capsule ovate or lanceolate, dehiscing both loculicidally and septicidally; having 2 ribs united at the tip and the placentæ split into 2 lamellæ. Seeds very minute, ellipsoid; testa reticulate.—Distrib. 2 species, one Indian, the other of the Malay Peninsula.

TETRAPHYLLUM ROSEUM, Stapf ex Ridley in Journ. Linn. Soc. XXXII. 524 (1895). Leaves opposite, closely approximate, the end ones subverticillate, usually in fours; elliptic or obovate-elliptic, obtuse at apex, narrowed at base; crenate-denticulate; above green, shining, bullate, pilose; beneath pale, punctulate, pilose on the nerves; 2.5 to 3.5 in. long, 1.75 to 2.25 in. broad; petiole .15 to .2 in. long.

Cymes few-flowered, from the axils of the last 3 or 4 leaves, collected in a terminal inflorescence 1 in. long; bracts oblong or lanceolate; pedicels slender, about ·2 in. long. Calyx deeply 5-fid, scarcely ·5 in. long; lobes ovate acute; tube obscurely 5-angled, glabrous. Corolla glabrous; tube nearly ·5 in. long, white, curved; limb pink, bilabiate, upper lip erect, 2-lobed, lower lip 3-lobed, lobes rounded. Stamens included; filaments filiform, spirally twisted, glabrous; anthers adhering at the apex, with a thick connective; cells oblong, divergent at base. Ovary oblong, puberulous; style as long as ovary; stigma capitate, sub-bilobed; placentæ 2-lamellate; the lamellæ densely ovulebearing. Capsule ovate-oblong, ·3 to ·5 in. long, as long as the persistent calyx.

SIAMESE STATES: Pungah, Curtis.

7. Loxocarpus, Br.

Herbs, scapigerous. Leaves ovate or oblong, petiolate, pubescent. Flowers 1 or more in a peduncled cyme, blue. Calyx-lobes 5, free to base or nearly so. Corolla campanulate, small, hardly bilabiate; lobes rounded. Stamens 2; filaments short, thick, sinuate; anthers reniform, large. Ovary oblong; style longer than stamens; stigma capitate. Capsule follicular, conic, dehiscing along the upper edge.—Distrib. Species 7, of the Malay Peninsula and Borneo.

Flowers 1 or 2 on slender silky scapes 2 to 2.5 in, long ... 1. L. semitorta. Flowers few or numerous on dichotomously branched viscidly hairy peduncles;—

1. Loxocarpus semitorta, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 61 (1905). Stemless. Leaves numerous; ovate or oblong, obtuse, rather thick, base broad; '3 to 1 in. long, '25 to '75 in. wide; above green silky, beneath with thick red-woolly raised nerves; petiole 1 to 2.5 in. long, thick, red-woolly. Scapes slender, 2 to 2.5 in. long, silky; flowers 1 or 2. Calyx-lobes lanceolate, hairy, '125 in. long. Corolla '5 in. long; tube broad, oblique, pale blue with violet streaks in the throat; lobes very short and indistinctly marked. Stamens: filaments short, curved; anthers reniform, purple. Ovary and style hairy, shorter than corolla, larger than stamens. Capsule '25 in. long, hornshaped, acuminate with the persistent style; base swollen. Didymocarpus semitorta, Clarke in DC. Monog. Phan V. i. 99, and in Hook. f. Fl. Br. Ind. IV. 352.

MALACCA: Mount Ophir, Griffith (K.D.) 3836; Maingay (K.D.) 1220; Ridley 3184, and all collectors. On rocks in the stream. "The Mount Ophir Violet."

2. Loxocarpus incana, R. Br. in Benn. Pl. Jav. Rar. 115, 120 (1840), and Ann. Nat. Sci. XIII. 2, 167. Stemless. Leaves ovate, cordate, serrulate, subacute, silky-tomentose above and beneath; 1 to 3 in. long, 75 to 1.5 in. wide; petiole .75 to 1 in. long. Peduncles 2 to 4 in. long, above dichotomously branched, viscid-hairy; flowers few or numerous. Calyx-lobes lanceolate, pubescent, hairy, white tinted green. Corolla-tube straight, thick; upper lobes oblong, recurved, lower lobes oblong, blue. Filaments straight. Pistil conic; style stout; stigma capitate. Capsule ovoid; tip upcurved, hairy. Miq. Fl. Ind. Bat. II. 737. L. alata, A. DC. Prodr. IX. 277. Didymocarpus incana, Benth. and Hook. f. Gen. Pl. II. 1022; Clarke in DC. Monog. Phan. V. 98, and in Hook. f. Fl. Br. Ind. IV. 352; Ridley in Journ. Linn. Soc. XXXII. 5121, and in Journ. Str. Br. R. As. Soc. No. 43, 62. Loxonia? alata, Wall. Cat. 809.

Penang: Government Hill, Waterfall, Curtis 297; Maingay (K.D.) 1228; Wallich 809. Perak: Hermitage Hill, Ridley; Bujong Malacca, Ridley 9782. Selangor: Bukit Kutu, Ridley.

3. Loxocarpus cærulea, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 62 (1905). Stemless or nearly so. Leaves several; ovate; base cordate; serrate, inæquilateral; 2 to 6 in. long, 1.5 to 4 in. wide; silky-hairy above, tomentose beneath; petiole 2 to 8 in. long, pubescent. Peduncles 6 to 12 in. tall, viscid-hairy; cymes compact or branched with 2 or 3 branches 2 in. long; flowers numerous; bracts lanceolate, narrow. Calyx-lobes lanceolate, narrow, shorter than the tube. Corolla pubescent, 2-lipped, '4 in. long and wide; tube short, broad, campanulate; upper lobes oblong obtuse, lower ones truncate, median one longer, blue with a violet mouth. Stamens exsert; filaments suddenly thickened in the middle, sigmoid; anthers connate, deep violet. Style slender. Capsule '4 to '5 in. long, lanceolate acute, horn-shaped, upcurved, viscid. Didymocarpus cærulea, Ridley in Journ. Linn. Soc. XXXII. 513.

PERAK: Larút Hills, at 5000 ft. alt., Ridley; King's Collector 6990; Scortechini 1427; Gunong Bubu, Wray 3809. Selangor: Bukit Hitam, Kelsall.

8. Parabæa, Ridley.

Herbaceous plants or with a shrubby stem. Leaves usually in a rosette, tomentose or hairy. Flowers small, white or pink, in simple or panicled cymes; peduncle usually long. Calyx small. Corolla white

explanate, campanulate, with a very short tube, distinctly 2-lipped or nearly regular; lobes equal, oblong or unequal, blunt. Stamens 2, fertile; filaments thick, short; anthers large, 2-celled, connivent by the tips. Disk none. Ovary sessile; style longer than the stamens, stout; stigma small, capitate. Capsule straight, narrow, slender, not twisted, splitting longitudinally. DISTRIB.—Species about 20. Siam-Malaya.

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Corolla-tube, campanulate: Sect. I. CAMPANULATE:
  Corolla .5 in. long :-
    Flowers many in large spreading panicles; leaves sparingly
    hispid, opposite
                                                          .. 1. P. cordata.
    Flowers solitary or few on slender peduncles:-
      Peduncles subterminal: leaves opposite, ovate:-
        Leaves hairy on margins and on midrib and nerves
        beneath; peduncles 1-flowered
                                                              2. P. campanulata.
        Leaves quite glabrous; peduncles branched dichoto-
        mously, branches 1-flowered ...
                                                              3. P. Scortechinii.
      Peduncles axillary; leaves crowded at apex of stem,
      lanceolate ..
                                                              4. P. cærulea.
  Corolla under .5 in. long; flowers few, crowded
                                                              5. P. pyroliflora.
Corolla-tube not campanulate, very short :- Sect. II. Breviflor :-
  Corolla-lobes equal or subequal, if slightly 2-labiate the
  lower lip hardly longer than the upper:-
    Flowers in compact umbels or cymes on pedicels .5 in.
    long or less at the apex of the peduncles:-
      Leaves not purple beneath, in a basal rosette; stem 0:-
        Flowers umbellate, pedicels .5 in. long; leaves ochre-
        yellow beneath
                                                              6. P. capitata.
        Flowers in compact scorpioid cymes; leaves pale
        beneath
                          ..
                                                              7. P. ferruginea.
      Leaves purple beneath, crowded at the apex of a short
      stem; flowers umbellate, pedicels .25 in. long
                                                              8. P. regularis.
    Flowers at the apex of slender cyme-branches 1 to 3 in.
      Leaves ochreous-tomentose beneath in a basal rosette:
      stem 0
                                                          .. 9. P. polita.
      Leaves red-woolly beneath; stem 2 in. long ...
                                                          .. 10. P. vulpina.
  Corolla lobes distinctly unequal, these of lower lip
  longer than those of upper:-
   Calyx-lobes lanceolate; leaves obovate, coarsely toothed,
   dull green; corolla .25 in. across ...
                                                              11. P. laxa.
   Calvx-lobes oblong or linear oblong obtuse :-
     Leaves oblong-elliptic, sparsely hairy; corolla .5 in.
      across
                                                              12. P. Curtisii.
     Leaves obovate, arachnoid on both sides, yellowish
     beneath; corolla .25 in. across ...
                                                         .. 13. P. obovata.
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1. PARABŒA CORDATA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 64 (1905). A tall herb, 2 ft. high; stem pubescent. Leaves opposite, ovate acuminate, inæquilateral at base, dentate, sparingly hispid above and beneath; nerves 10 pairs, hairy beneath; 6 to 7 in. long, 4 in. wide; petiole 1 in. long. Peduncles stout, 6 to 8 in. long, pubescent, bearing a spreading panicle 4 to 6 in. long; bracts in pairs at the base of each bifurcation, ovate, glabrous, 125 in. long; pedicels slender, 5 in. long, glabrous. Calyx-lobes lanceolate, free to base, glabrous, 5 in. long. Corolla campanulate, 5 in. long, white tinted violet; lobes short, equal, rounded, with 2 rows of glands on each. Stamens 2; filaments short: anthers subglobose, large; staminodes minute. Ovary slender, glabrous. Capsule sausage-shaped, 4-angled, 1.5 in. long, glabrous, rather thick, splitting on two sides. Seeds minute, deep red, oblong. Didymocarpus cordata, Jack; R. Br. Benn. Pl. Jav. Rar. 119; Ann. Sc. Nat. 2, XIII. 164; Wall. Cat. 781; DC. Prodr. IX. 265; Mig. Fl. Ind. Bat. II. 726; Clarke in DC. Monog. Phan. V. 84, t. 9, and in Hook. f. Fl. Br. Ind. IV. 350; Ridley in Journ. Linn. Soc. XXXII. 514.

Penang: Wallich 781; Maingay (K.D.) 1224; W. Fox; Curtis 452. Perak: Larút Hills, Scortechini 296, 400; Ridley 2913, 10682; King's Collector 2227, 2331, 6378. Common on rocks at 2000 to 6000 ft. alt.

Var. debilis, Ridley. Rhizome fleshy; stem 6 in. tall, pubescent. Leaves thin, ovate oblique; base obtuse; apex acute or subacute; margin crenate dentate; sparingly hispid, 1.5 to 4 in. long, 1 to 2 in. long. Panicle 4 to 6 in. long, glabrous, weak, few-branched; branches short and thin; bracts ovate; flowers smaller.

KEDAH: Gunong Jerai, Ridley.

VAR. ophirensis, Ridley.

Tall and weak. Leaves thin, lanceolate, subacute or acute, narrowed at the base; 6 in. long, 2 in. wide. Panicle weak, glabrous; bracts lanceolate; flowers smaller, white. Capsule smaller, curved, 4 in. long.

MALACCA: Mount Ophir, on a big cliff in the forest below Padang Batu, Ridley 3183.

2. Parabæa campanulata, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 65 (1905). Stem slender, herbaceous, 1 ft. tall, shortly hairy. Leaves opposite, in distant pairs, elliptic acute, entire or obscurely crenulate; above glabrous except the edge fringed with multicellular hairs; beneath glabrous except the midrib and elevated nerves about 12 pairs; scurfily hairy; 2.5 to 3.5 in. long, 1.25 in. wide; petiole scurfy-hairy .125 to .375 in. long. Peduncles subterminal, 1.5 in. long, 1.flowered, rufous-hairy; bracts 2, alternate, linear, minute; pedicel 5 in. Calyx-lobes linear, hairy, .125 in. long. Corolla campanulate, .5

in. long, apparently white; lobes broad, rounded. Stamens 2, very short; anthers subglobose. Style slender, pubescent. Capsule (unripe) cylindric, velvety, 75 in. long, including the style.

SELANGOR: above the Gap on the road to the Sempang mine, 3000 to 4000 ft., Curtis—a single specimen.

A very distinct plant of a weedy habit, with solitary flowers of the type of $P.\ cordata$.

3. Parabea Scortechini, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 66 (1905). Stem herbaceous, glabrous. Leaves opposite; ovate acuminate; base rounded, inæquilateral; margins crenate; quite glabrous; nerves 8 pairs; 3 to 3.5 in. long, 1 to 2.5 in. wide; petiole 5 in. long. Peduncle slender, erect, subterminal, 3 in. long, glabrous; branches dichotomous, few, 1 in. long; flowers solitary on the ends of the branches. Calyx-lobes free almost to the base, oblong obtuse, 125 in. long, glabrous, fleshy. Corolla campanulate, 5 in. long, glabrous; lobes rounded. Anthers broad, elliptic; filaments very short.

PERAK: Scortechini (no number or locality).

A single incomplete specimen. The plant is allied to P. cordata, of which it has quite the flowers, but is quite glabrous.

4. Parabæa cærulea, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 66 (1905). Stem woody, 3 to 4 in. long, 125 in. through. Leaves crowded at the top, narrowly lanceolate, linear acuminate, narrowed gradually to the base; 4 to 5 in. long, 25 in. wide; above dark green, nearly glabrous; midrib prominent, beneath pale cinnamon colour; nerves about 30 pairs joined at the tips. Peduncles slender, axillary, 4 in. long, pubescent, 1- to 2-flowered. Calyx-lobes linear, 125 in. long, obtuse. Corolla campanulate, 5 in. long and nearly as wide at the base, pubescent, base pale; lobes deep blue, rounded. Stamens 2; filaments very short, sigmoid; anthers broad, rounded, oblong. Style fairly stout; stigma heart-shaped. Capsule very narrow, cylindric, 1 in. long.

TRINGGANU: Bundi, E. Rostado. The upper part of the stem among the leaves is covered with silvery hairs.

5. Parabea Pyroliflora, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 67 (1905). Stem woody, 3 in. tall or more, pubescent. Leaves alternate, ovate or ovate lanceolate, acuminate at both ends; 3 to 4 in. long, 1.5 in. wide; entire; bright green, silky pubescent above, beneath paler; petiole over 1 in. long, pubescent. Peduncles several from the upper axils, erect, 3 to 4 in. long, shortly hairy. Calyx-lobes lanceolate, short-pubescent. Corolla campanulate, funnel-shaped, white, 4 in.

long; lobes short, rounded. Stamens 2; filaments short and thick; anthers large, elliptic. Style thick, curved upwards, longer than the corolla; stigma very small, capitate. Capsule spreading, 1 in. long, terete, terminated by rather a long style, glabrous. Didymocarpus pyroliflora, Ridley in Trans. Linn. Soc. Ser. 2, III. 330.

Pahang: Tahan river woods, Ridley 2164.

6. Parabea capitata, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 67 (1905). Stemless or with a stout rootstock. Leaves in a rosette, orbicular, base rounded, subpeltate; 6 in. long, 5 in. wide; bright green, glabrous above, ochre-yellow beneath; tomentose; nerves raised, reticulate; petiole stout, 2 in. long. Peduncle slender, 8 in. tall; flowers numerous in an umbel on the top, with 2 broad, blunt, oblong bracts, 25 in. long, below. Pedicels 5 in. long. Calyx campanulate; lobes linear, oblong, obtuse, 3 in. long, green, hairy. Corolla 5 in. across; lobes subequal, rounded, white. Filaments very short, straight; anthers reniform. Style curved up, longer than corolla, white. Capsule spreading, linear, straight, beaked, 1.5 in. long.

Perak: Bujong Malacca, Curtis 3215; Kamuning, Machado. On limestone rocks.

VAR. oblongiflora, Ridley. Leaves oblong, narrowed at the base.

PERAK: Kuala Dipang and Sungei Siput, Curtis 3107; Tambun Ridley 9832; Batu Kuran, Scortechini 1581; Goping, King's Collector 456, 4325.

7. Parabea ferruginea, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 68 (1905). Stemless or nearly so. Leaves in a rosette, ovate cordate, obtuse, crenulate; above covered with scattered hairs, below tomentose with longer hairs, paler; nerves elevated; 3 in. long, 2.5 in. wide; petiole 1.5 to 2 in. long. Peduncles 3 in. long, ferruginous-tomentose; cyme compact, scorpioid, ferruginous-hispid. Calyx-lobes as long as the corolla, green, ferruginous-hispid, lanceolate. Corollatube very short; limb explanate, not bilabiate; lobes broad, obovate, obtuse, subequal and similar, white or tinted with rose. Stamens 2, short; filaments broad, spathulate, thick; apex 3-toothed; anthers conic, connate by the tips. Ovary conic; stigma rounded, entire, discoid.

KEDAH: Lankawi, on damp rocks, Curtis 2566.

8. Parabæa regularis, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 68 (1905). Stem woody, 1.5 in. long. Leaves crowded at the top, very unequal, oblong-lanceolate, obtuse, base cuneate inæquilateral; margins crenulate; dark green, glabrous above, purple, minutely tomentose beneath, with elevated nerves; 3 in. long, 1.5 in. wide; petiole 1.5 in. long, tomentose. Peduncles slender, pubescent, 1 in. long; branches

very short and slender, '25 in. long, umbelled, brown-tomentose; bracts lanceolate, obtuse; flowers few, very small, very shortly pedicelled. Calyx-lobes lanceolate, brown-tomentose, as long as the corolla-tube. Corolla hardly '25 in. across, white; lobes oblong, obtuse, equal, not bilabiate. Stamens 2; filaments sigmoid, thick; anthers rounded, ovoid. Style longer than stamens; stigma capitate. Capsule '5 in. long, cylindric, scabrid, rather thick, straight. Didymocarpus regularis, Ridley in Journ. Linn. Soc. XXXII. 515.

KEDAH: Lankawi Islands, Curtis.

9. Parabæa polita, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 69 (1905). Stemless. Leaves in a rosette, ovate, crenate, obtuse; base rounded; above deep shining green, beneath ochreous tomentose, with nerves and nervules reticulate; 1 to 8 in. long, 4 to 4·5 in. wide; petiole 4 in. long. Peduncle over 1 ft. long, slender, with brown ochreous fur; branches few, 3 in. long, umbellate; bracts linear, oblong obtuse, brown-woolly; pedicels ·25 in. long. Calyx-lobes linear, green, ·125 in. long. Corolla sub-bilobed, ·5 in. across, white, back tinted pink; lobes rounded. Stamens 2; filaments thickened at the base; anthers orange, reniform. Style stout, pink at base, white above; stigma capitate.

PERAK: Bujong Malacca, Curtis 3214 part.

Ridley thinks it is perhaps a hybrid between P. capitata and P. vulpina.

10. Parabæa vulpina, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 69 (1905). Stem 2 in. long, thick, covered with red wool. Leaves elliptic, rounded at each end, crenulate, above sprinkled with pale multicellular hairs, beneath covered densely with branched rufous hairs arranged stellately; nerves beneath strongly elevated, 6 pairs; reticulations elevated; 1.5 to 3 in. long, 1 to 2 in. wide; petiole 1 to 3 in. long, densely red-woolly. Peduncles slender, 6 to 8 in. long, red, with a few branched hairs; branches slender, 1 to 3 in. long, trichotomous; bracts very small, linear, obtuse, glabrous. Calyx-lobes narrow, linear, glabrous. Corolla white, 25 in. across; lobes rounded, subequal. Stamens 2; anthers very large, reniform. Style short, thick. Capsule cylindric, narrow, glabrous.

PERAK: Bujong Malacca, Curtis 3214; Hot Springs, Ipoh, Curtis 3132. On limestone rocks.

11. Parabæa laxa, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 70 (1905). Stem very short, woody, thickly brown-tomentose. Leaves obovate, coarsely crenate-serrate, narrowed at the base into the winged petiole; 3 to 7 in. long, 2 to 3 in. wide; dull green, densely hairy, tomentose on both surfaces. Peduncle slender, 5 to 6 in. long, terminated by a much-branched umbel of slender branches 3 in. long; pedicels

slender, 125 in. long; flowers numerous; bracts very small. Calyx shortly 5-cleft; lobes lanceolate, short, green. Corolla 125 in. across, white or tinted rosy; upper lobes broad, oblong, recurved; lower lip shortly trifid; central lobe broadest. Filaments short, swollen in the middle; anthers yellow, reniform. Style longer than stamens. Capsule linear, cylindric, straight, 5 in. long, tipped with the elongate style.

KEDAH: Lankawi at Kwah, Curtis 2571.

12. Parabæa Curtish, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 70 (1905). Stemless. Leaves oblong, elliptic, crenate, obtuse; 6 in. long, 2.5 in. wide; above sprinkled with hairs; petiole rufous-hairy, 1.5 in. long. Scapes 10 in. long, rufous-tomentose, bearing an umbel of 4 or 5 branches at the top about 2 in. long; bracts at base of umbel oblong, obtuse, .25 in. long; pedicels short, rufous-tomentose. Calyx-lobes linear, oblong, obtuse, hairy, .125 in. long. Corolla .5 in. across, white; buds tinted pink; tube very short; limb bilobed; upper lobes short, rounded, lower lobes larger. Stamens: filaments very short, thick, curved; anthers reniform, triangular. Style much longer than stamens, bent. Ovary cylindric; stigma wide, discoid. Capsule (unripe) cylindric, acuminate, straight.

Perak: Bujong Malacca, Curtis 3214.

13. Parabæa obovata, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 71 (1905). Stem short. Leaves crowded at the top, thin, obovate, blunt; base cuneate; 3 in. long, 1·5 in. wide; thinly arachnoid on both surfaces, beneath yellowish; petiole ·25 in. long. Peduncle slender, 3 to 6 in. long, glabrous; branches few, terminal; bracts narrowly oblong, obtuse. Calyx-lobes oblong, obtuse, glabrous. Corolla ·25 in. across; lower lip longer than upper one; lobes oblong, rounded. Stamens 2; anthers reniform; filaments short and thick. Style short and thick; stigma capitate.

Kedah: Lankawi, Gunong Chinchang, Curtis. One specimen only seen.

9. BŒA, Commers.

Herbs or shrublets with a woody stem. Leaves opposite or whorled, generally on the back. Peduncles axillary, usually elongate, laxly or compactly cymose or panicled; bracts small; flowers large or small, blue or white. Calyx of 5 narrow sepals. Corolla widely campanulate, with a short tube usually distinctly 2-lipped; lobes ovate, obtuse. Stamens 2, perfect, with short curved thick filaments; anthers ovoid, coherent; cells ovoid. Disk absent. Ovary sessile; style as long, glabrous above; stigma small, capitate. Capsule slender, cylindric or

fusiform-cylindric, when ripe spirally twisted. Seeds minute.—DISTRIB. Species about 22 in India, Siam, China, and Malaya.

Corolla limb 1.5 in. across, blue; sepals pubescent 1. B. paniculata. Corolla limb less than 1 in. across :-Calyx-lobes more or less pubescent:-Stems 1 ft. or more in height:-Corolla blue :-.. 2. B. verticillata. Leaves white beneath ... 3. B. cærulescens. Leaves yellowish brown beneath ... Corolla white 8. B. suffruticosa. Stems under 6 in. in height:-.. 5. B. lanata. Leaves arachnoid above; corolla rose-pink Leaves glabrous above .. 6. B. acutifolia. Calyx-lobes glabrous :-Leaves arachnoid above; corolla white with pink mouth .. 4. B. elegans. Leaves glabrous above:-Corolla pale lilac .. 7. B. divaricata. Corolla white 9. B. parviflora. DOUBTFUL SPECIES. 12. B. ferruginea. 10. B. patens. 11. B. glabra.

1. Bea paniculata, Ridley in Journ. Linn. Soc. XXXII. 519 (1895). Stem-base woody, 4 in. or more long, 5 in. thick; above a rosette of leaves; upper part of stem 1 ft. or more long, stout, deeply grooved, white-arachnoid; branches numerous, whorled, erect, 6 in. long, covered with brown wool. Leaves crowded in a rosette at the top of the woody portion of the stem, lanceolate acuminate, narrowed for a long distance at the base; 6 in. long, 1 in. wide; above grey arachnoid, beneath greyish-white with cinnamon-coloured raised nerves. Flowers numerous; pedicels 5 in. long; bracts 4 or 5 at each whorl of branches, leafy. Calyx-lobes short, lanceolate, pubescent, 125 in. long. Corollatube very short; limb 1.5 in. wide, blue; lobes large, rounded, unequal. Filaments short and thick, 25 in. long. Style curved, as long as stamens. Capsule 75 in. long, thick. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 72

SELANGOR: limestone rocks, Kuala Lumpur, Kelsall and Ridley 1970, 1976 and 8226. Perak: Sungei Siput, Curtis 3105; Kuala Dipang, King's Collector 8271; Batu Kuran, Scortechini 1611. A superb plant growing in the cracks of limestone rocks.

2. Beaverticillata, Ridley in Journ. Linn. Soc. XXXII. 519 (1895). Stem-base woody, 3 in. or more long, nearly ·25 in. in diameter; above herbaceous, 1·5 ft. tall, 4-angled, white-arachnoid with branches whorled, each whorl 3 in. or less apart. Leaves whorled, lanceolate acuminate, narrowed at the base into a petiole; 4 in. long, ·75 in. wide or more;

above grey-arachnoid, beneath white-arachnoid with raised nerves. Flowers numerous, blue; bracts leafy, 25 to 5 in. long. Calyx-lobes lanceolate subulate, arachnoid, 125 in. long. Corolla 5 in. wide; lobes rounded. Stamens very short; anthers pear-shaped. Style much longer than stamens, straight. Capsule fusiform, acuminate, 5 in. long. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 73.

Selangor: limestone rocks at Kuala Lumpur, Kelsall, Ridley 1975, 8551.

3. Bea cerulescens, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 73 (1905). Whole plant over 2 ft. tall; upper part of stem stout, grooved, woolly. Leaves oblanceolate, subobtuse, narrowed to the base; above dark green, densely pubescent, beneath ochreous covered with felted wool; 6 to 8 in. long, 1.25 to 2 in. wide; petiole winged to the base or not. Panicle 2 ft. or more long, large; branches whorled, yellowwoolly; bracts below leaf-like, above linear, narrow, yellow. Calyxlobes lanceolate, woolly. Corolla-tube very short; limb '75 in. across, pale blue, upper lobe shorter; lobes rounded; lower lip unequally lobed, longer, central lobe longest. Stamens 2; anthers reniform, conic, large; filaments short, curved. Style bent on the cylindric ovary, pubescent; stigma large, discoid. Capsule thick, glabrous, '75 in. long.

PERAK: Sungei Siput, Curtis 3137; Kinta, King's Collector 7175, 7062, 8276.

4. BEA ELEGANS, Ridley in Journ. Linn. Soc. XXXII. 522 (1895). Stem about 6 in. long, woody, decumbent, '125 in. thick, arachnoid. Leaves whorled in threes, '5 to 3 in. apart, lanceolate acute, narrowed to the base; 1 to 2.5 in. long, '25 to '5 in. wide; above grey-arachnoid, beneath cinnamon-arachnoid. Peduncles from the upper axils, slender, glabrous, 6 in. long; cyme terminal, 3 in. long, with few slender branches. Calyx very short; lobes lanceolate, glabrous. Corolla '5 in. across, with broad rounded lobes, white-pink in the mouth. Anthers oblong. Style rather short; stigma clubbed. Capsule 1 in. long, glabrous, linear, acuminate. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 74.

Kedah: Gunong Jerai on granite precipices, Ridley.

5. Bea lanata, Ridley in Journ. Linn. Soc. XXXII. 520 (1895). Stem short, stout, woody, 2 in. long, curved, with white wool. Leaves crowded, lanceolate acuminate, narrowed into the petiole; arachnoid above, densely woolly beneath; 3 in. long, '75 in. wide; petiole woolly, 3 in. long, winged to base. Panicles few, branched, axillary, dense, 1 to 5 in. long. Calyx as long as the corolla-tube; lobes lanceolate, woolly outside. Corolla thin, '5 to '75 in. across, glabrous, rose-pink;

lobes rounded. Anthers subglobose. Style thick. Capsule 5 in. long, thick, glabrous. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 74.

Kedah: Langkawi, Dayong Bunting, on limestone rocks, Curtis 2569.

6. Bea acutifolia, Ridley in Journ. Linn. Soc. XXXII. 519 (1895). Stem woody, 3 in. or more long, '25 in. through; internodes '5 in. long. Leaves crowded at the top, oblanceolate, acute, narrowed to the base; 6 in. long, 1.5 in. wide; above glabrous dotted, beneath cinnamon-arachnoid. Panicles axillary, 6 in. long; peduncles arachnoid; branches short, slender. Calyx-lobes 3, lanceolate, acute, '125 in. long, arachnoid. Capsule cylindric, acute, glabrous, '75 in. long. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 75.

KEDAH: Langkawi, Goa Chinta, Curtis 2791.

7. Bea divaricata, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 75 (1905). Stem about 4 in. tall, thick and woody. Leaves in a rosette on the top, oblanceolate, crenulate, obtuse, narrowed into a winged petiole; nerves and nervules beneath elevated, 15 pairs; above glabrous, beneath covered with a thin brownish tomentum; 7 in. long, 2·5 in. wide. Peduncles rather stout, terete, smooth, 7 to 16 in. tall; branches umbellate, decompound, 1 ft. or more long; pedicels of flowers ·2 in. long, covered with brown fur. Calyx-lobes lanceolate, acute, green, glabrous, shorter than the corolla-tube. Corolla ·25 in. across, pale lilac; tube short, dilated; limb bilabiate, lobes rounded. Stamens: anthers connate, rounded with acute bases; filaments thick, sigmoid. Style slender; stigma horseshoe-shaped. Capsule cylindric, strongly twisted, 1 in. long.

KEDAH: Lankawi, Ayer Hangat, Curtis 3683.

8. Bea suffruticosa, Ridley in Journ. Linn. Soc. XXXII. 518 (1895). A branching shrub, 1 to 2 ft. tall, with rather slender branches ·125 in. through, angled, slightly arachnoid. Leaves scattered, lanceolate, subacute, narrowed at the base; 3 in. long, ·5 in. wide; above nearly glabrous, punctate, beneath covered with brownish tomentum; nerves conspicuous; petiole ·25 to ·5 in. long. Panicles axillary, dense, 1 in. long, with short branches brownish-woolly; buds brown-woolly. Calyx longer than the corolla-tube; lobes linear, lanceolate, thick, tomentose outside. Corolla ·25 to ·35 in. across, white; lobes short, oblong, rounded. Anthers oblong, obtuse. Capsule fusiform, very thick, ·25 in. long, tipped with the long style. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 76.

Kedah: Langkawi, on a small island north of Kwah, Curtis 3682, 2565.

9. Bea parviflora, Ridley in Journ. Str. Br. R. As. Soc. No. 43,

76 (1905). Stem slender, shrubby, branching, covered with ferruginous tomentum. Leaves lanceolate, acuminate; base cuneate, unequal; 4 in. long, 1 to 1.25 in. wide; above glabrous, beneath covered with rusty wool; nerves elevated, 11 pair. Peduncle 6 in. long, slender, glabrous; panicle umbellate, of 6 slender branches in a terminal whorl; branchlets glabrous, numerous, slender; bracts very narrow, linear; flowers very small, numerous, white; pedicels slender, 125 in. Calyxlobes lanceolate, glabrous, 5. Corolla very small, white; tube very short; upper lobes subacute, lower ones oblong. Anthers large, reniform. Style shorter than anthers. Capsule very slender, cylindric, 25 in. long, terminated by the slender style.

Perak: Hot Springs at Ipoh and Sungei Siput, not common, Curtis 3134; Kinta, King's Collector 7108. On limestone rocks.

DOUBTFUL SPECIES.

10. Bœa patens, Ridley in Journ. Linn. Soc. XXXII. 520 (1895). Almost stemless. Leaves rosulate, oblong, obtuse, serrulate-crenulate, inæquilateral; 4 to 6 in. long, 2 to 3 in. broad; upper surface softly pubescent, lower pale ferruginous-tomentose; petiole 1 in. long. Peduncle stout, terete, 18 in. long, softly ferruginous-lanate; branches long, divaricate, 2-forked; primary bracts oblong, '25 in. long, secondary smaller; cymules scorpioid, few-flowered; flowers small, white, '125 in. broad; pedicels '06 in. long. Calyx-lobes free to the base, short, lanceolate, acute, glabrous. Corolla campanulate, glabrous; lobes 2 oblong-obtuse, 3 ovate-obtuse, shorter and broader. Stamens with short slender curved filaments as long as tube; anthers large, oblong. Pistil glabrous; ovary cylindric, attenuated into a slender little-exsert style; stigma small, scarcely dilated. Capsule '5 in. long, glabrous, very slender.

SIAMESE STATES: Pungah, Curtis.

11. BŒA GLABRA, Ridley in Journ. Linn. Soc. XXXII. 521 (1895). A succulent, glabrous herb; stem short, 1 to 2 in. long. Leaves undulate, ovate-rotundate, inæquilateral, 6 in. long, 3·5 in. broad or broader; petiole 1 to 2 in. long, thick; upper leaves smaller, opposite. Peduncles subterminal, 3 to 4 in. long, thick; cymes terminal, congested, scorpioid, ·5 in. long; pedicels short. Calyx-tube short, conical; lobes 5, equal, obcuneate, truncate, ·125 in. long. Corolla white, ·5 in. broad; lobes rounded, obtuse. Stamens 2; filaments sigmoid, broad at the base, attenuate above; anthers oblong, acute on both sides, rather large. Style cylindric, thick, glabrous, curved; stigma scarcely thickened, obliquely ovate.

SIAMESE STATES: Pungah, Curtis 3039.

12. Bea ferruginea, Ridley in Journ. Linn. Soc. XXXII. 521 (1895). Stemless or with a short thick stem; roots large and thick. Leaves many, congested, spreading, ovate, cordate, obtuse, crenulate; upper surface clothed with sparse hairs, lower green, paler, tomentose, the raised nerves clothed with long hairs; when dry somewhat black above, ferruginous-tomentose beneath; blade 3 in. long, 2.5 in. broad; petiole 1.5 to 2 in. long. Peduncles 3 in. long, ferruginous-tomentose; cyme scorpioid, ferruginous-hispid. Calyx-lobes linear-lanceolate, as long as the corolla, green, ferruginous-hispid. Corolla 3 to 5 in. broad, white or pink, spreading; lobes broad, equal, obovate-obtuse; tube very short. Stamens 2, short; filaments broad, spathulate, 3-toothed at apex; anthers yellow, conical, cuneate at the tips. Ovary conical, attenuate in a short, curved, cylindric, narrowed style; stigma rather broader, flat, entire.

Kedah: Langkawi Island, on damp rocks, Curtis 2566.

Ridley remarks that, not having seen the fruit, he is uncertain as to the genus.

10. PHYLLOBŒA, Benth.

Herbs or half-shrubby plants. Leaves opposite, petioled. Cymes pedunculate, many-flowered; bracts large, conspicuous; flowers large, pink or blue. Calyx large, 2-lipped; one lip 2-lobed, the other 3-lobed or of 3 large connate sepals. Corolla broadly campanulate, 2-lipped, 3- to 5-lobed. Stamens 2, short; anthers large, rounded. Capsule lanceolate, at length twisted.—Distrib. Species 2, one Burmese, one Malayan.

Phyllobæa speciosa, Ridley in Journ. Linn. Soc. XXXII. 522 (1895). A shrub, 1 or 2 ft. tall; stems white-tomentose. Leaves in distant pairs, lanceolate-acuminate, 6 in. long, 1.5 in. wide; above glabrous, beneath white-arachnoid; petiole 1 in. long. Peduncle stout, lateral, erect, nearly a foot tall; flowers sessile, scattered; bracts ovate, lanceolate, .5 in. long, white-arachnoid. Calyx of 3 sepals, connate, ovate, oblong, woolly, .4 in. long. Corolla 1 in. long, blue; tube broad; lobes 3, two oblong-truncate, the third much broader. Stamens short, not longer than the ovary. Style long, woolly. Capsule 1 in. long, lanceolate, cylindric, acuminate, woolly.

Kedah: Langkawi, common on limestone rocks on the small islands, Curtis 2564.

11. BŒICA, Clarke.

Herbs or half-shrubby plants with the habit of $B \alpha a$. Leaves oblong, elliptic or lanceolate, more or less tomentose or hairy. Inflorescence racemose or panicled, axillary; flowers small, lilac or white. Calyx 5-fid. Corolla-tube very short; lobes subequal, rounded. Sta-

mens 4; filaments very short; anthers rounded, connivent. Style curved, larger than the stamens. Capsule linear cylindric.—DISTRIB. Species 4 or 5, in Assam, Burma, and the Malay Peninsula.

Ridley says: "Most of the few described species are based on flowerless specimens, and are all very similar and closely resemble Baa divaricata in habit, but the capsule is straight and not twisted. The type-species, however (B. filiformis, Clarke), has 4 stamens instead of 2. The Malayan one described below differs from these in habit, and I have seen no fruit, but there is no other genus to which it can be referred on account of its 4 very short stamens arranged in a circle round the pistil. The only other genus allied to it is Platystemma, a Himalayan plant with distinctly 2-lipped flowers."

Beica brachyandra, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 78 (1905). Stemless. Leaves obovate, serrate, hairy, dark green, obtuse; 3 in. long by 1.5 in. wide; nerves 6 or 7 pair; covered beneath with long red hairs; back of leaf punctate. Scape short, few-flowered, about 3 in. long, hairy, unbranched. Calyx-lobes free nearly to base, linear, hairy, green, nearly as long as corolla-lobes. Corolla-tube very short; lobes broad, rounded, oblong, explanate, subequal, pale lilac, about 5 in. across. Stamens 4; filaments very short; anthers broad, waxy, subglobose, connivent round the pistil. Style longer than stamens, slender, curved, white. Capsule cylindric, narrow, 1 in. long, scabrid, straight, on pedicels elongated to 5 in.

KEDAH: Langkawi, Gunong Chinchang, at Kwala Malacca, Curtis.

Ridley says this plant was found quite dried up in February, 1899, but was brought in alive and flowered in the Botanic Gardens, Penang.

12. Orchadocarpa, Ridley.

Herb or shrublet, with opposite unequal leaves. Flowers small, blue, racemose or cymose, pedicelled. Calyx-lobes free to base, narrow-lanceolate. Corolla-tube short; limb 2-lipped unequally. Stamens 2; filaments short, exsert, sinuate, glabrous; anthers bilobed, reniform, connivent by their edges. Ovary hairy, oblong; style short; stigma capitate. Capsule oblong, hairy, enclosed in the sepals.—Distrib. One species, Malayan.

Orchadocarpa Lillacina, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 78 (1905). Stem short to 4 in. long, stout, woody. Leaves crowded at the top, long-petioled, thin, ovate or ovate-lanceolate, acute, strongly serrate, covered with closely-felted short hairs; base broad, inæquilateral; 3 to 7 in. long, 1.5 to 3 in. wide; petiole slender, 3 to 6 in. long. Peduncle 3 to 4 in. long, pubescent, villous, bearing a terminal, pubescent, umbelliform panicle, or simply racemose. Calyx-lobes linear, pubescent, 1 to 2 in. long. Corolla pale lilac-blue; tube very short; limb dis-

tinctly bilabiate, upper lip smaller lobes short rounded, lower lip longer, trifid; median lobe longer than the others, oblong-obtuse, pubescent across. Stamens 2; filaments from the mouth of the corolla-tube, thick, twisted at the top; anthers large, reniform. Ovary oblong, pubescent; style distinct; stigma very small, capitate. Capsule short, oblong, hairy, enclosed in the calyx, beaked.

Perak: Scortechini 406; Gunong Batu Putih, Wray 298, 302.

13. LEPADANTHUS, Ridley, n. gen.

Herb with fistular stem. Leaves opposite, petioled, ovate, toothed. Flowers in axillary or terminal, flexuose, distichous racemes. Calyxlobes free nearly to the base, ovate acute. Corolla as long as calyx, bilabiate; upper lobe much the shorter. Stamens 2 fertile; anthers elliptic. Ovary elliptic; style long; stigma oblique, entire. Capsule as long as calyx-lobes, loculicidal; placentæ thick, elevated. Seeds very minute, warted.—Distrib. One species.

The plant on which the genus is founded has the habit of Rhyncotecum, but the fruit is capsular.

[Lepadanthus, Ridley, gen. nov. Herbacea, caule fistuloso. Folia opposita, petiolata, ovata, dentata. Flores distichi in racemis axillaribus vel terminalibus flexuosis. Calycis lobi fere ad basin liberi, ovati, acuti. Corolla calyci æqualis, bilabiata, labio superiore multo breviore. Stamina 2 fertilia; antheræ ellipticæ. Ovarium ellipticum, stylo longo, stigmate obliquo, integro. Capsula calycis lobis æquilonga, loculicida, placentis crassis elevatis. Semina minutissima, verrucosa.]

Lepadanthus flexuosa, Ridley, n. sp. A herb, reaching 18 in. in height; stem hairy, fistular. Leaves very thin when dry; ovate, subacute, rounded and slightly unequal at base, strongly toothed; 5 in. long, 4 in. wide; nerves about 8 to 10 pair, hairy; petiole slender, 3 to 4 in. long. Racemes several, pubescent, 3 to 4 in. long, including the 1 to 1.5 in. long peduncle; rachis flexuose with distant alternate flowers on capillary secund pedicels .5 in. long; bracts in pairs, linear, deflexed, .125 in. long. Calyx-lobes 5, ovate, acuminate, pubescent, 3-nerved. Corolla small; tube short, thick; upper lip bifid, much shorter than the lower, glabrous. Stamens 2; filaments extremely short, adnate to the corolla-tube; anthers elliptic. Ovary elliptic; style pubescent, as long as calyx-lobes or longer; stigma clavate, oblique. Capsule .25 in. long, oblong, glabrous. Seeds elliptic, dark red.

Kedah: inside the caves, Gunong Grenong, Fox 3811 (a poor specimen only).

[L. FLEXUOSA, Ridley, sp. nov. Herba pubescens caule 40-50 cm. alto fistuloso. Folia siccitate tenuissima, ovata, subacuta, rotundata, ad basin parum inæqualia, dentata; 12 cm. longa, 10 cm. lata; nervi utrinque 8-10, pubescentes; petiolus gracilis, 7-10 cm. longus. Racemi plures, pubescentes, cum pedunculo 7-10 cm. longi; rhachis flexuosa, floribus alternis distantibus, pedicellis secundis capillaribus; bracteæ geminæ lineares deflexæ, 3 mm. longæ. Calycis lobi 5, ovati, acuminati, pubescentes, trinervii. Corolla parva, tubo brevi crasso; labium superius bifidus, inferiori multo brevius. Stamina 2; filamenta brevissima, tubo corollæ adnata. Ovarium ellipticum; stylus pubescens, calycis lobis æquilongus vel longior; stigma clavatum, obliquum. Capsula 6-7 mm. longa, oblonga, glabra. Semina elliptica nigrorubra.

Peninsula Malayana: in Prov. Kedah in specubus ad Gunong Grenong.]

14. Rhynchoglossum, Blume.

Herbs, succulent and nearly glabrous. Leaves opposite, thin. Raceme terminal, lax; flowers pendent. Calyx campanulate, toothed or lobed. Corolla-tube cylindric, narrowed above; limb bilobed; upper lobe very short bifid, lower much longer, 3-lobed. Stamens 2 perfect, affixed to the middle of the corolla-tube; anthers connivent; cells ellipsoid, parallel; staminodes 2, or absent. Disk cylindric. Ovary ovoid, glabrous; style longer; stigma dilate. Capsule included in the calyx, ellipsoid, membranous, 2-valved. Seeds narrowly ellipsoid, smooth.—Distrib. Species 2, in India, Malaya and the Philippines.

RHYNCHOGLOSSUM OBLIQUUM, Blume Bijdr. 741 (1826). Succulent herb, 20 in. tall. Leaves 1 to 3 in long, 5 to 1 in. wide; glabrous or nearly so, ovate-acuminate; petiole 5 in. long or less. Racemes lax, about 6 in. long; flowers numerous, pale to deep violet; bracteoles filiform, 1 to 2 in. long. Calyx tubular, 25 in. long, enlarged in fruit; lobes triangular or lanceolate. Corolla 6 in. long; lower lip several times longer than the upper one, subtrilobed. Capsule ellipsoid, 3 in. long. DC. Prodr. IX. 274; Clarke in DC. Monog. Phan. V. 161, in Comm. & Cyrt. Beng. t. 88, and in Hook. f. Fl. Br. Ind. IV. 367; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 79. R. Blumei, DC. Prodr. IX. 274. Wulfenia intermedia, Wall. Cat. 408. Loxotis intermedia, Benth. Scroph. Ind. 57; G. Don Gen. Syst. Dichl. Pl. IV. 664. L. obliqua, R. Br. in Benn. Pl. Jav. Rar. 102, t. 24; Miq. Fl. Ind. Bat. II. 731, t. 35, fig. 3.

PERAK: Larút Hills, Fox; Batang Padang, Wray 1447, at 2000 ft. elevation.—DISTRIB. Tenasserim and Malay Islands.

15. EPITHEMA, Blume.

Small rock-herbs, succulent, pubescent; stems simple or branched. Leaves few, alternate or opposite above, petioled or sessile; ovate, usually cordate. Peduncles long, from the upper axils, erect; bract

single, ovate or cucullate; flowers small, blue or white, in a scorpioid cyme on short pedicels. Calyx campanulate; lobes 5, acute. Corollatube short; limb distinctly 2-lipped; lobes acute or obtuse, subequal. Stamens: 2 posterior perfect, 2 anterior ones sterile, shorter; anthers coherent. Disk unilateral or almost surrounding the ovary. Ovary ovoid; style longer; stigma subcapitate. Capsule globose, enclosed in the enlarged calyx on a thickened and a longer pedicel, splitting transversely (a pyxis). Seeds ellipsoid or oblong, spirally reticulate.—Distrib. Species about 6 Asiatic, all very closely allied, and one African.

EPITHEMA SAXATILE, Blume Bijdr. 738 (1826). Succulent herb, 3 to 12 in. tall; stem viscid, pubescent. Leaves very variable, opposite, ovate cordate, denticulate or crenulate, hairy; 1.5 to 6 in. long, 1 to 5 in. across; petiole 25 to 1.5 in. long. Peduncle 1 to 2 in. long, viscid; cyme 75 in. across, subtended by a broad sessile truncate denticulate bract; flowers numerous, subsessile. Calyx viscid, pubescent, tubular, split about half-way down into 5 narrow lobes 25 in. long. Corolla-tube as long, straight, white; three upper lobes oblong, obtuse, tipped with violet; lower two connate, broader, subovate, denticulate, thinner, pellucid, tipped mauve with darker central spots; mouth of tube inside hairy. Stamens 4, in 2 pairs; filaments incurved, adnate to the mouth of the tube, white; anthers 2, oblong, connate, yellowish. Ovary ovoid, enclosed in a fleshy truncate yellow disk; style stout, glabrous; stigma capitate. Capsule globose, pubescent, surrounded by the much enlarged ovate acute sepals and borne on the thickened elongate to 125 in. pedicel, circumsciss. Seeds very numerous, brown, elliptic, fusiform, spirally ribbed. DC. Prodr. IX. 278; Mig. Fl. Ind. Bat. II. 736; Zoll. Verz. Ind. Archip. 55; Clarke in DC. Monog. Phan. V. 178; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 80.

Kedah: Langkawi Islands, Curtis 2107. Perak: Telor Pinang Ipoh, Ridley; Batu Kuran, Scortechini 1580; King's Collector 10941; Sungei Ryah, Kunstler 283; Goping, King's Collector 5872. Selangor: Kuala Lumpur Caves, Ridley 8217. Pahang: Kota Glanggi, Ridley.—Distrib. Java, Borneo, Sumatra. On limestone rocks.

16. Monophyllæa, R. Br.

Succulent herbs with an unbranched stem and one large herbaceous cordate-ovate sessile leaf. *Peduncles* numerous, from the leaf-base, with racemose or cymose inflorescence; flowers small. *Calyx* deeply 5-cleft; lobes elliptic, obtuse. *Corolla* small, usually white; tube short, cylindric; limb distinctly 2-lipped, lobes 5. *Stamens* 4 perfect; filaments

short; anthers cohering in pairs or altogether. Disk unilateral or a complete ring. Ovary 1-locular; style short; stigma capitate. Capsule membranous, enclosed in the enlarged calyx, irregularly splitting. Seeds oblong, minute, reticulate.—Distrib. Species 7, of the Malay Peninsula and Islands, and Siam.

Leaf glabrous; calyx-lobes not spreading in fruit
Calyx-lobes ovate, rounded; flowers white . . . 1. M. Horsfieldii.
Calyx-lobes lanceolate, acute; flowers white and brown . . 2. M. glabra.
Leaf strigosely hairy; calyx-lobes spreading in fruit . . 3. M. patens.

1. Monophyllea Horsfieldi, R. Br. in Benn. Pl. Jav. Rar. 121 (1840), and Ann. Sc. Nat. 2, XIII. 160. Stem 6 in. to 1 ft. tall. Leaf ovate-cordate, 6 to 12 in. long, 1 to 12 in. wide; glabrous, glaucous beneath. Racemes 2 to 7, often stout, 9 in. long; flowers numerous, subsecund; pedicels ·25 in. long, glabrous. Calyx-lobes glabrous, rounded, ovate, ribbed. Corolla-tube short, cylindric; upper lip 2-lobed, lower 3-lobed; lobes rounded, white. Stamens 4, didynamous, glabrous; anthers connate. Style short, glabrous; pistil subglobose. Capsule globose, enclosed in the enlarged calyx-lobes. Seeds oblong, brown, reticulate, very numerous. DC. Prodr. IX. 274; Miq. Fl. Ind. Bat. II. 731; Clarke in DC. Monog. Phan. V. 182, and in Hook. f. Fl. Br. Ind. IV. 370; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 82.

Selangor: Kuala Lumpur Caves, *Curtis*; *Beccari*. Perak: Goping, *King's Collector* 443, 515.—Distrib. Sumatra: Batu Pantih (*Forbes* 2660); Java (*Lobb*). On limestone rocks.

2. Monophyllæa glabra, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 82 (1905). Stem succulent, 6 in. to 1 ft. tall. Leaf ovate-cordate, obtuse, glabrous; glaucous beneath; 2.5 to 6 in. long, 2 to 6 in. wide. Racemes slender, glabrous, 4 to 10, 2 to 8 in. long, lax; flowers numerous, in pairs; pedicels slender, 25 in. long, spreading, deflexed. Calyx-lobes 125 in. long in fruit, lanceolate, acute, glabrous, not spreading. Corolla brown and white. Capsule enclosed in the sepals, cylindric, oblong.

SIAMESE STATES: Kasúm, Curtis 3219.

3. Monophyllea patens, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 82 (1905). Stem 1 to 4 in. long, viscid-hairy. Leaf ovate-cordate to ovate-lanceolate, strigose, hairy; 6 in. long, 4 to 6 in. across. Racemes slender, 4 to 20, pubescent, 4 to 5 in. long; flowers in pairs; pedicels slender, pubescent, 25 in. long in fruit. Calyx-lobes lanceolate, hairy, spreading in a stellate manner in fruit, ribbed. Corolla-tube short; lobes white. Stamens 4, glabrous, didy-

namous. Ovary ovoid; style short, thick, glabrous. Capsule globose, glabrous. Seeds numerous, black, tessellated.

Selangor: Kuala Lumpur Caves, Ridley 8222; King's Collector 7052. Perak: Kinta, Curtis 3136; Sungei Siput, Curtis 3135; Batu Kuran, Scortechini 1574, 1579; Goping, Kunstler 449. On limestone rocks.

17. STAURANTHERA, Benth.

Herbs, succulent, pubescent. Leaves alternate, the opposite ones reduced, falcate, elliptic, acuminate, inæquilateral. Cymes peduncled, lax; bracts small; flowers medium-sized, showy. Calyx campanulate; lobes 5. Corolla campanulate, rounded; tube short, shortly spurred or gibbous; limb 2-lipped; lobes rounded, nearly equal. Stamens 4 perfect; anthers connate, bilocular, bases diverging. Ovary subglobose or ovoid, no disk; style short. Capsule depressed, globose, irregularly split. Seeds minute, obovoid-reticulate.—Distrib. Species 3. Assam and Malay Islands.

Flowers large, base of corolla spurred 1. S. grandiflora. Flowers small, base of corolla not spurred . . . 2. S. umbrosa.

1. STAUBANTHERA GRANDIFLORA, Benth. Scroph. Ind. 57 (1835). Succulent herb with a fleshy stem about 6 in. tall. Leaves 6 in. long by 4 in. wide or less; oblong, obtuse, crenulate; deep green above, bullate, glabrous, inæquilateral, pubescent on both sides; petiole 1 in. long. Cyme short, pubescent, 3 in. long, with a few (9) large flowers; bracts short, ovate; flowers 1.25 in. across. Calyx-lobes lanceolate, ovate, pubescent. Corolla-tube short and broad, with a short spur at the base; lobes short, broad, rounded, violet with a central yellow bar reaching to the spur. Stamens subequal, 4; filaments slender; anthers connate. Ovary ovoid; style shorter than the stamens; stigma capitate. Capsule 2 in. broad. Clarke in DC. Monog. Phan. V. 190, and in Hook. f. Fl. Br. Ind. IV. 371; G. Don Gen. Syst. Dichl. Pl. IV. 665. S. grandifolia, Dietr. Syn. Pl. III. 582; R. Br. in Benn. Pl. Jav. Rar. 121, and Ann. Sc. Nat. 2, XIII. 167; DC. Prodr. IX. 278; Hook. Bot. Mag. t. 5409; Floral Mag. Ser 1 (1866), t. 272; Miq. Fl. Ind. Bat. II. 735; Clarke Comm. & Cyrt. Beng. t. 89 bis; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 83. Glossanthus? grandiflora, Benth. in Wall. Cat. 6395.

Penang: Wallich 6395; rocks near Balik Pulau, Curtis. Perak: Larút, King's Collector 2248.—Distrib. Burma. Rare, on rocks.

2. STAURANTHERA UMBROSA, Clarke in Comm. & Cyrt. Beng. t. 89 (1874). Stem 3 to 6 in. tall. Leaves ovate, oblong, falcate, inæquilateral, strigosely hairy especially beneath; 6 to 8 in. long, 2 to 4

in. wide. Cymes spreading, few- to 10-flowered; peduncles and pedicels hairy. Calyx shortly 5-lobed, cup-shaped; lobes triangular, 25 in. long in flower, larger and spreading in fruit. Corolla 5 in. long, white with a violet spot in the centre. Ovary unilocular. Capsule circumsciss near the base. Clarke in DC. Monog. Phan. V. 189, and in Hook. f. Fl. Br. Ind. IV. 731; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 83. Cyananthus umbrosa, Griff. Notul. IV. 154; Ic. Pl. Asiat. t. 437.

PERAK: Telok Pinang, near Ipoh, Ridley 9773; Kinta, King's Collector 7144. Selangor: woods at the Kuala Lumpur Caves, Ridley 8224. Pahang: Tahan Woods, Ridley 2183. Johore: Gunong Panti, Ridley 4166.—Distrib. Assam. A ground plant in damp rocky woods.

18. RHYNCHOTECUM, Blume.

Shrubs, little branched, young parts red-woolly. Leaves opposite or alternate. Cymes axillary, decompound; flowers small, numerous. Calyx 5-cleft nearly to the base; lobes narrow. Corolla small, campanulate; limb 2-lipped; lobes 5, ovate or oblong, subequal. Stamens 4 perfect, affixed to near the corolla base; filaments short, curved; anther-cells 2, subparallel. Ovary sessile, ovoid; disk very small, annular or absent; style much longer than ovary; stigma subcapitate. Berry small, globose, with persistent style; pericarp pulpy. Seeds very small, smooth.—Distrib. Species 9, Indo-Malayan.

RHYNCHOTECUM PARVIFLORUM, Blume Bijdr. 775 (1826). A littlebranched shrub about 3 ft. tall, leafy above, upper parts ferruginoushairy. Leaves opposite, lanceolate, acute, cuneate at the base, serrate; 8 in. long, 3.5 in. wide; dark green, glabrous above except the midrib, covered with red wool beneath, thickest on the nerves; nerves 13 pairs; petiole 1 in. long. Cymes numerous, short, from the lower part of the stem. laxly branched, red-woolly; flowers very small, yellowish-white. Calux-lobes nearly free to the base, linear-lanceolate, acute, woolly, 125 in. long. Corolla little longer than the calyx-lobes, campanulate; lobes oblong, obtuse, white. Stamens 4, very short; filaments short and thick. Style longer than the ovary. Capsule ovoid-globose, hairy, shorter than the sepals. G. Don Gen. Syst. Dichl. Pl. IV. 663; Dietr. Syn. Pl. III. 581; DC. Prodr. IX. 285; Zoll. Verz. Ind. Archip. (1854) 55; Miq. Fl. Ind. Bat. II. 750; Clarke in DC. Monog. Phan V. i. 195, and in Hook. f. Fl. Br. Ind. IV. 373; Ridley in Journ. Linn. Soc. XXXII. 523, and in Journ. Str. Br. R. As. Soc. No. 43, 84. Isanthera parviflora, Ridley in Trans. Linn. Soc. Ser. 2, III. 331.

PENANG: Wallich; Pulau Betong and Penara Bukit, Curtis 3035;

Perak: Larút Hills, Ridley; King's Collector 2237; Scortechini 1222. Pahang: Kuala Tahan, Ridley 2171.—Distrib. Java, Sumatra.

19. Cyrtandromæa, Zoll.

Shrubs with square stems, leafy above. Leaves opposite, subequal, herbaceous, ovate elliptic or lanceolate, serrate, petioled. Flowers 1 to many, in axillary or basal cymes; bracts 2 in the middle of the pedicel. Calyx tubular, shortly 5-toothed or lobed, enlarged in fruit, usually red. Corolla large, white, tubular, thin, glabrous; tube dilated at apex; lobes rounded, subequal. Stamens 4 perfect, in 2 pairs, subsimilar; filaments linear; anthers ovoid, small. Pistil longer than stamens; stigma cup-shaped. Capsule globose or oblong, enclosed in the enlarged calyx, opening irregularly; walls membranous. Seeds numerous, sinuate, oblong, obtuse, ribbed, reticulate.—Distrib. Species 10, Malayan.

1. CYRTANDROMEA ACUMINATA, Benth. and Hook. f. Gen. Pl. II. 1020 (1876). A shrubby plant, 3 to 4 ft. long; stem rather weak, hollow, young parts pubescent. Leaves lanceolate or ovate, narrowed into the petiole, acute, serrate, strigose, pubescent above, also on the nerves beneath; 4 to 6 in. long, 2 to 3 in. wide; petiole 1 in. long. Flowers solitary, axillary, on short '125 in. long, lanceolate, slender, hispid peduncles with 2 very small linear bracts in the middle. Calyx tubular, '5 in. long, glabrous, with short teeth, dull red. Corolla nearly straight, 1 in. long; tube thick; lobes rounded, white. Capsule oblong, 4-angled, '25 in. long. Seeds minute, deeply reticulate. Clarke in DC. Monog. Phan. V. i. 185, and in Hook. f. Fl. Br. Ind. IV. 370; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 86. Cyrtandra? acuminata, Wall. Cat. 1808. Busea subsessilis, Miq. Fl. Ind. Bat. II. 733.

TRINGGANU: Bundi, Rostado; Penang: Porter in Wallich's Collector, 808; Maingay (K.D.) 1232-2; King; Tonoh, Machado. Perak: Larút Hills, Ridley 2917; Scortechini 83, 329; King's Collector 5342, 2139. Selangor: Ginting Bidai, Ridley. Negri Sembilan: Bukit Sulu, Cantley.

2. CYRTANDROMEA MEGAPHYLLA, Hemsley in Hook. Ic. Pl. t. 1555 (1884). Herb about 3 ft. tall; stem bluntly 4-angled, pithy in the centre, pubescent. *Leaves* opposite, subequal, herbaceous, ovate,

acutely acuminate, coarsely serrate, base rounded or subcordate; 6 to 10 in. long, 3 in. wide; pubescent; petiole 3 to 5 in. long. Cymes from a little above the axils, lax, many-flowered. Calyx tubular, pubescent, shortly 5-toothed, 5 in. long, inflated in fruit. Corolla about 2 in. long, white, obliquely infundibuliform; lobes rounded, subequal. Ovary perfectly bilocular. Ridley in Journ. Linn. Soc. XXXII. 523, and in Journ. Str. Br. R. As. Soc. No. 43, 86.

Perak: Larút Hills at 2100 ft. alt., Wray; Scortechini 584; Gunong Batu Putih, King's Collector 8155. Selangor: Ginting Peras, Ridley 7602.

3. Cyrtandromea grandis, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 87 (1905). A large shrub, several feet tall; base of stem woody, 5 in. through, glabrous. Leaves opposite, equal, herbaceous, lanceolate acuminate, glabrous, narrowly acuminate at the base; margins dentate; 12 in. long, 4 in. wide; nerves elevated, 10 pairs; petiole 1 to 1.25 in. long. Cymes large, lax, borne on the base of the stem, and on the upper part below the leaves, many-flowered, 2.5 to 6 in. long, pubescent; pedicels .25 in. long. Calyx tubular, pubescent, with linear lobes, red, .5 in. long. Corolla white, 1 in. long; tube straight, thick; lobes rounded. Capsule globose, .5 in. long, enclosed in the enlarged calyx. Seeds minute, black, oblong, ribbed and reticulate.

PERAK: Ulu Bubong, King's Collector 10150; Gunong Batu Putih, King's Collector 8155. Selangon: Kuala Lumpur, Curtis; Ridley 10498; 15th mile Pahang Track, Ridley 8552; Bukit Hitam, Ridley 7576.

20. CYRTANDRA, Forst.

Half-shrubby plants, terrestrial or rarely epiphytic; stems often branched, usually tall. Leaves opposite, subequal or one smaller. Cymes axillary, on long or short peduncles, many-flowered; bracts large or small, free or connate; bracteoles ovate or narrowed or absent. Calyx tubular, 2- to 6-lobed, usually 5-lobed; lobes lanceolate. Corolla-tube short, usually pubescent, infundibular, straight; lobes 5, subequal or more or less distinctly 2-lipped, usually white-spotted or marked with yellow-brown or red. Stamens 2, perfect, shortly exsert or included, affixed to the corolla; anthers bilocular, connivent, free or coherent; staminodes small, 2 to 3. Disk annular or unilateral. Ovary ovoid or oblong; style long, filiform; stigma sub-bilobed. Berry sausage-shaped or ovoid, firmly fleshy, usually beaked with the persistent style. Seeds numerous, minute, ellipsoid, smooth or obscurely reticulate.—Distrib. About 170 species, in the Malay Peninsula and Archipelago eastwards to Polynesia.

Bracts free:—			
Leaves of a pair with one usually manifestly smaller than the			
other, sometimes entirely suppressed, or less frequently (C. pen-			
dula) reduced to a subulate process opposite the perfect leaf:—			
Leaves 12 in. long, their margins strongly toothed especially			
towards the apex, all quite alternate from suppression of one			
of each pair; calyx 5-lobed; corolla ·5 in. long	1.	C.	dispar.
Leaves 7 to 9 in. long, their margins entire or occasionally			
(C. pendula sometimes) crenate:—			
Bracts ovate acute; leaves with one of each pair usually			
smaller than the other and sometimes (C. falcata often)			
suppressed entirely; leaf-margins always entire; calyx			
5-lobed:—			
Bracts 1 in. long; leaves 7 to 9 in. long, main nerves			
about 12 pairs, prominent, both leaves of each pair			
always present and the two sometimes subequal; corolla			
over 1 in. long	2	C.	suffruticosa.
Bracts 5 in. long; leaves 7 to 8 in. long; main nerves			
about 10 pairs, not prominent, one leaf of each pair always			
smaller than the other and sometimes entirely suppressed;			
corolla unknown	3.	C.	falcata.
Bracts lanceolate-acuminate; leaves 8 in. long, with one			
of each pair reduced to a subulate process; margins entire			
or sometimes crenate; calyx 2-fid; corolla 1.5 in. long	6.	C.	pendula.
Leaves of a pair always subequal:—			
Margins of leaves serrate; calyx ·5 in. long, 2-fid; corolla			
1 in. long	4.	C.	pilosa.
Margins of leaves crenate; calyx 1.5 in. long, 3-fid; corolla			Ī.,
1.5 in. long	5.	C.	lanceolata.
Bracts connate in a large white cup; leaves of a pair always			
subequal	7.	C.	cupulata.
물물하면 이 얼마나에 그리고 하는 사람이 사라가 되었다.			

1. Cyrtandra dispar, DC. Prodr. IX. 282 (1845). Shrub with a stout, pale, reticulate, fistular stem; obscurely 4-angled. Leaves alternate, obovate oblanceolate, inæquilateral, petioled; strongly toothed, especially at the apex; glabrous above, red-pubescent beneath; 12 in. long, 4 in. wide; petiole 1 in. long. Flowers small, very numerous, in axillary cymes; pedicels 25 in. long, hispid. Calyx persistent, cup-shaped, with 5 lanceolate, acuminate, hairy lobes. Corolla white, 5 in. long; tube dilated upwards, hairy outside; lobes short, obtuse, rounded. Stamens shorter than the tube; abortive ones very much reduced. Pistil hairy. Berry 25 in. long, oblong, ellipsoid, hairy. Miq. Fl. Ind. Bat. II. 742; Clarke in DC. Monog. Phan. V. i. 203, t. 23, and in Hook. f. Fl. Br. Ind. IV. 375; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 88. C. frutescens, Wall. Cat. 807 partly, not of Jack.

Penang: Government Hill, Curtis 1204; Wallich 807; (part);

Maingay (K.D.) 1232. Perak: Bujong Malacca, Ridley 9703; Larút Hills, Ridley and Fox, Scortechini 367, 1231; Wray 2196; King's Collector 2052, 5131, 3891.—DISTRIB. Sumatra.

2. Cyrtandra suffruticosa, Ridley in Trans. Linn. Soc. Ser. 2, III. 330 (1893). A large shrub, 4 ft. tall, with hollow 4-angled pale stems 25 in. thick. Leaves opposite, one of each pair often very much smaller alternately on one side or the other; lanceolate, abruptly acuminate, subfalcate, inæquilateral; edges entire; nerves conspicuous, about 12 pairs; glabrous when adult, young leaves and petioles redpubescent; 7 to 9 in. long, 2.5 to 3 in. wide; petiole 5 to 75 in. long. Peduncles short and thick, axillary; bracts free, ovate acute, pubescent, 1 in. long, 5 in. across; flowers about 6 in a head, nearly sessile. Calyx deciduous; sepals linear. Corolla glabrous, over 1 in. long; base cylindric, dilated upwards; lobes rounded, obtuse, white with brown streaks in the throat. Anthers large, elliptic. Style pubescent. Berry 75 in. long, sausage-shaped. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 89.

PERAK: Scortechini 142; Gopeng, King's Collector 4720; Kota Bahru, King's Collector 569; Tupai, Larút, Wray 2845. Johore: Tengarah, Fielding; Pulau Tiuman, Ridley. On rocks.

Ridley says it is nearly allied to a Bornean species, C. oblongifolia, Clarke, but much larger in all parts. It is generally found growing on rocks or (King's Collector 4720) from the top of a high tree. Wray describes the flowers as "white marked in the throat with dark claret; bracts green without, claret within; fruit light green, finely spotted, paler."

3. Cyrtandra falcata, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 89 (1905). Epiphytic shrub, about 2 ft. tall; stem quadrangular, fistulose, pale. Leaves lanceolate acuminate, falcate; alternate, often with small opposite ones; glabrous when adult; narrowed at the base into the petiole; nerves about 10 pairs; 7 or 8 in. long, 1.5 in. wide; petiole 1 in. long, pubescent. Cymes axillary, 125 in. shortly peduncled; bracts broadly ovate, acute, pubescent, 5 in. long; flowers few, shortly pedicelled. Fruit fusiform, 5 in. long.

Perak: Wray 2845; Scortechini 142. Selangor: woods round the Kuala Lumpur Caves, Ridley 8219.

Allied to C. oblongifolia, Hook. f., and C. suffruticosa, Ridley, but the leaves are much narrower than those of the latter, and thinner and with more conspicuous nerves than those of the former.

4. CYRTANDRA PILOSA, Blume Bijdr. 770 (1826). Shrub with stout 4-angled hollow stems as much as 5 in. through, 3 ft. tall, upper parts pubescent. Leaves opposite, obovate, narrowed into a winged petiole; margins serrate; above more or less covered with pale hairs from a

swollen base, in old leaves often glabrescent, beneath covered with red hairs on the nerves; nerves prominent 10 to 12 pairs; 8 to 18 in. long, 3 to 4 in. wide. Cymes small, nearly sessile, axillary; bracts ovate or lanceolate acuminate, hairy, 1 in. long. Calyx tubular, hairy, 5 in. long, bifid. Corolla white, 1 in. long, silky-hairy; tube infundibuliform, stout; upper lobes oblong obtuse, lower two connate, shortly bifid, obtuse, punctate above. Stamens little longer than the tube; filaments glabrous; abortive stamens short. Fruit ovoid, conic, acute, brown, reticulate-tessellate, 5 to 75 in. long. G. Don Gen. Syst. IV. 661; DC. Prodr. IX. 282; Miq. Fl. Ind. Bat. II. 742; Zoll. Verz. Ind. Archip. 55; Clarke in DC. Monog. Phan. V. i. 231, and in Hook. f. Fl. Br. Ind. IV. 375; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 90. C. decurrens, De Vriese Pl. Ind. Bat. Reinwdt.14; Miq. l.c. 746; Clarke ll.cc. 231, 375.

Penang: Penara Bukit, Wallich 807, on banks in forests. Perak: Larút Hills, Ridley 2915; Curtis 2897; Scortechini 354, 270; King's Collector 5588. Selangor: Bukit Kutu, Ridley 7574, Bukit Hitam, Pahang Track, 8560, 8554. Negri Sembilan: Bukit Tanga, Napier; Bukit Sulu, Cantley. Johore: Gunong Panti, Ridley; Bukit Tanah Abang, Kelsall.—Distrib. Tenasserim to New Guinea. In rocky woods up to about 2000 ft. altitude.

Ridley says he is unable to separate specifically the forms described respectively under the names of *C. pilosa*, Bl., and *C. decurrens*, De Vr., at least as far as applies to the variety *Wallichii* of the latter. The main distinction seems to be in the amount of hairiness of the leaves, in which point the plant seems very variable.

5. CYRTANDRA LANCEOLATA, Ridley in Journ. Linn. Soc. XXXII. 527 (1895). Stem about 1 ft. tall, quadrangular, upper part pubescent, the base bare. Leaves oblanceolate acute, narrowed at the base, crenulate, almost entirely glabrous; 12 in. long, 4 in. wide. Cymes at the base of the stem below the leaves very shortly peduncled, lax, manyflowered; pedicels '75 in. long, hispid; bracts lanceolate, small, hispid. Calyx 1.5 in. long, tubular, hispid; lobes 3, linear-acuminate. Corolla 1.5 in. long, dilated above, pubescent, white, throat yellow. Anthers long, narrowed above. Style 1 in. long, pubescent; stigma bilobed; lobes oblong, linear. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 91.

Jонове: Gunong Panti, Ridley.

6. CYRTANDRA PENDULA, Blume Bijdr. 768 (1826). Stem 1 or 2 ft. tall. Leaves alternate, ovate cordate or lanceolate, entire or crenate; dark green and glabrous above, often barred with white and covered with reddish tomentum beneath; 8 in. long, 4 to 6 in. wide; petiole 3 to 6 in. long, opposite leaf in each internode reduced to a subulate process

Capitulum of 20 flowers on peduncles 4 in. long, decurved, appressed-hairy; bracts lanceolate, acuminate, hairy; flowers shortly pedicelled. Calyx-tube 5 in. long, thin, shortly bifid. Corolla-tube 1.5 in. long; base narrow, curved, ventricose upwards, cream-coloured or pale yellow, hairy; upper lip of two rounded lobes, lower of three broader oblong rounded ones, all creamy white or pale yellow with purple spots in the mouth and tube. Stamens 2, glabrous; filaments purplish, sinuate; anthers oblong, connivent. Style stout, white; stigma transversely oblong. Fruit sausage-shaped, 5 in. long. G. Don Gen. Syst. Dichl. Pl. IV. 660; DC. Prodr. IX. 281; Miq. Fl. Ind. Bat. II. 739; Hook. Ic. Pl. t. 736; Clarke in DC. Monog. Phan. V. i. 242; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 91. C. bicolor, Jack in Trans. Linn. Soc. XIV. 27; DC. l.c.; Clarke in Hook. f. Fl. Br. Ind. IV. 375; Miq. l.c.

Perak: Larút Hills, Curtis 2036; Scortechini 142 and 254; Wray 2845; Ulu Bera, King's Collector 10810. Selangor: Kuala Lumpur, Bukit Hitam, Ridley. Sungei Ujong: Bukit Sulu, Cantley. Malacca: Maingay. Pahang: Kuala Tembeling, Ridley. Johore: Gunong Panti, Pulau Tiuman. Singapore: Bukit Timah, Ridley 2703; King.—Distrib. Java and Sumatra.

7. Cyrtandra cupulata, Ridley in Journ. Linn. Soc. XXXII. 527 (1895). A shrubby plant 2 or 3 ft. tall; stem terete or more or less 4-angled above, covered with red hair. Leaves opposite, equal, very variable, oblanceolate with an acuminate base, serrately toothed; scantily hairy above, more hairy beneath; petiole sometimes winged to the base, villous, 1 in. long; blade 12 in. long, 4 in. wide. Peduncles ·5 in. long, axillary in pairs, villous; bracts connate in a white hairy cup 1 in. long; bracteoles short, lanceolate, acute, white; flowers numerous, opening singly, little longer than the bract. Corolla 1 in. long, curved, infundibuliform, 2-lipped, pubescent, white, yellow and brown in the mouth; lobes 5 subequal, ovate, obtuse. Stamens included, 2. Pistil short; ovary oblong, with a terminal tuft of hair; style short, curved; stigma clavate, bilobed. Fruit ·5 in. long, fusiform. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 92.

PERAK: Tapa, Wray 1389 and 191; Ulu Bubong, King's Collector 10250; Larút Hills, Scortechini 366; Chanderiang, King's Collector 5833, in wet woods. Malacca: lower slopes of Mount Ophir, Ridley 7575; Sungei Buluh, Ridley 10550. Pahang: Tahan Woods, Ridley 2150.

Family XC.—VERBENACEÆ.

Herbs, shrubs or trees. Leaves opposite or verticillate (apparently alternate in Geunsia), simple, digitate or pinnate (Peronema); stipules none. Inflorescence cymose, racemose or spicate, often in panicles; bracts usually small, sometimes leafy; flowers hermaphrodite or sometimes polygamous, generally irregular, often brightly coloured, sometimes with coloured calvx or enlarged coloured involucre. inferior, gamosepalous, 5- to 4- (rarely 6- to 8-) lobed, often accrescent. Corolla gamopetalous; tube usually cylindric or dilated above, often curved; limb 2-lipped or subequally lobed; lobes 4 or 5, rarely more. Stamens usually 4 didynamous, sometimes 2, sometimes 5, 6 or more, inserted on the corolla-tube; filaments free; anthers 2-celled, opening longitudinally. Ovary superior, sessile, 2- to 4-celled, entire or 4-lobed; ovules variously attached, 2 (sometimes 1) in each cell; style terminal; stigma entire or bifid at apex. Fruit drupaceous with bony pyrenes, or capsular, 1- to 4-celled; mesocarp usually fleshy; endocarp usually bony. Seeds erect or pendulous, separate in distinct cells; albumen usually none; embryo straight; radicle inferior.—DISTRIB. Tropical regions of both hemispheres, very few extending to temperate countries; species about 750.

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Inflorescence spicate, centripetal (the lowest flowers opening
first) (Tribe I. VERBENEÆ) :-
  Shrubs or herbs with short spikes; calvx minute; stamens 4;
  anther-cells parallel :-
    Fruit a drupe with fleshy mesocarp
                                                               1. LANTANA.
    Fruit dry with thin granular mesocarp
                                                               2. LIPPIA.
  Herbs with long spikes; calyx long, tubular; stamens 2;
  anther-cells divaricate
                                                               3. STACHYTARPHETA.
Inflorescence cymose, centrifugal (the end flowers opening
first):-
  Cymes paniculate; drupes fleshy (Tribe II. VITICEE):-
    Leaves simple :-
      Corolla regular; stamens isomerous, equal:-
        Flowers 5-merous; drupe with 5 to 10 pyrenes
                                                              4. GEUNSIA.
        Flowers 4-merous; drupe with 4 pyrenes ...
                                                               5. CALLICARPA.
        Flowers 4- to 6-merous; drupe with 14-celled endocarp,
        included in the accrescent calyx
                                                               6. TECTONA.
      Corolla 2-lipped; stamens didynamous:-
        Drupe with 1 pyrene:-
          Flowers small
                                                          .. 7. PREMNA.
          Flowers large ...
                                                          .. 8. GMELINA.
        Drupe with 4 pyrenes (1 to 3 often suppressed)
                                                          .. 9. CLERODENDRON.
   Leaves digitate or in 1 species unifoliolate; pyrene 1
                                                          .. 10. VITEX.
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Cymes paniculate; drupes capsular (Tribe III. CARYOPTERIDEÆ):-Leaves impariprimate; fruit 4-celled; calyx not enlarged in fruit; trees 11. PERONEMA. Leaves 1- to 3-foliolate; fruit 2-celled; calyx much enlarged in fruit; climbers 12. Petræovitex. Cymes capitate; bracts of the flower-head usually large and involucriform; large climbers (Tribe IV. SYMPHOREMEÆ):-Involucral bracts 6; corolla-lobes subequal; stamens included or exsert .. 13. Sphenodesma. Involucral bracts 4; corolla 2-lipped, the two lobes of the upper lip the longest; stamens exsert 14. Congea. Cymes densely capitate or in short spikes, centripetal; flowers small; calyx-segments 5, much imbricate; trees or shrubs (Tribe V. AVICENNIEÆ) .. 15. AVICENNIA.

Holmskiöldia sanguinea, Retz Obs. VI. 31 (1791), is a straggling shrub of the Eastern subtropical Himalaya, with a large red obconic calyx and red flowers, often cultivated in gardens and occasionally found as an escape.

Penang: on Government Hill, Curtis 2879.

DURANTA PLUMIERI, Jacq. Select. Stirp. Amer. 186, t. 176, fig. 76 (1763), is a blue-flowered shrub cultivated in gardens and sometimes found run wild in their neighbourhood.

SINGAPORE: Ridley.

Tribe I. VERBENEÆ.

1. LANTANA, Linn.

Erect or subscandent, often rambling, pubescent or scabrous shrubs, rarely herbs; branches usually tetragonal, sometimes prickly. Leaves simple, opposite or ternate, petiolate, inciso-crenate, more or less rugose. Flowers in dense pedunculate spikes from the axils of the leaves, variable in colour; the spikes capitate, ovoid or cylindric; bracts conspicuous, persistent, ovate or lanceolate; bracteoles none. Calyx small, membranous, campanulate, truncate or 4- to 5-toothed. Corolla hypocrateriform; tube slender, cylindric; lobes 4 to 5, spreading, Stamens 4 didynamous, included in the corolla-tube and orbicular. inserted at its middle; anthers broadly oblong with parallel cells. Ovary 2-celled; ovule solitary in each cell, erect from the base or laterally attached close to the base; style short; stigma oblique or sublateral, thickened. Fruit a drupe with more or less fleshy mesocarp; endocarp hard, separating when ripe into two 1-celled, 1-seeded Seed exalbuminous; testa reticulate; radicle inferior.— DISTRIB. Species about 50, tropical or subtropical, mostly American, a few African or Asiatic.

Bracts lanceolate; without prickles 1. L. salvifolia.
Bracts ovate, acuminate; with recurved prickles .. 2. L. aculeata.

1. LANTANA SALVIFOLIA, Jacq. Hort. Schoenbr. III. 18, t. 285 (1798). An erect branching shrub, reaching 3 to 8 ft. in height; stems rough, without prickles; branchlets quadrangular, strigosely hispid, Leaves opposite or in whorls of 3, membranous yellowish-brown. when dry; ovate-lanceolate, acute at apex, suddenly narrowed and then decurrent at base; both surfaces rugose, the upper strigosely hispid, the lower villous and pale; margins crenate-serrate; 2 to 5 in. long, 1 to 2 in. broad; main nerves 8 to 12 pairs, the lowest pair opposite and more oblique than the others, all curving to the margin; reticulations prominent; petiole 2 to 4 in. long, winged by the decurrent margins of the blade. Spikes globose to oblong, 5 to 1 and even 1.5 in. long, gradually elongating as the fruit ripens; peduncles angular, hispid, 1 to 3 in. long; bracts ovate, caudate-acuminate, strigosely villous, ·25 in. long. Calyx minute, truncate, densely villous. Corolla-tube curved, slightly inflated opposite the stamens, villous without, 2 in. long; lobes spreading, rounded, the uppermost slightly acute. Filaments short; anther-cells equal. Drupe oblong, purple; exocarp thin, hispid; mesocarp fleshy; endocarp rugose, the 2 pyriform pyrenes of which it is composed closely adherent. Seed elliptic; testa reticulate; cotyledons thin. Baker in Dyer Fl. Trop. Afr. V. 276; Schauer in DC. Prodr. XI. 605. L. indica, Roxb. Hort. Beng. 46 (1814), and Fl. Ind. III. 89; Wall. Cat. 1823 A,B; Wight Ill. t. 173 b, fig. 3, and Ic. t. 1464; Trimen Fl. Ceyl. III. 346; Clarke in Hook. f. Fl. Br. Ind. IV. 562; Cooke Fl. Bomb. II. 418; Prain Beng. Plants 825. L. dubia, Wall. Cat. 1821, 2 and c, not 1; Royle Ill. 300 t. 73, fig. 2. L. collina, Done. in Jacquem. Voy. Bot. 136, t. 141. L. alba, Schauer l.c. 606; Dalz. & Gibs. Bomb. Fl. 198; Brandis For. Fl. 369; Kurz For. Fl. II. 253; Boiss. Fl. Orient. IV. 532, not of Miller, Done. or Link.

Penang: Ridley; Curtis 121; Deschamps. Perak: at Teluk Anson, Ridley 10762. Malacca: Ridley 10115. Singapore: Deschamps; Kunstler 135.—Distrib. India, Burma, Ceylon, Tropical and South Africa.

2. Lantana aculeata, Linn. Sp. Pl. 627 (1753). A very straggling erect shrub with many branches, 4 to 8 ft. high; branchlets quadrangular, armed with recurved prickles. Leaves opposite; ovate, acute at apex, truncate or cordate at base; the blade decurrent; upper surface scabrous, lower pubescent; margins crenate, 1 to 3 in. long, 1 to 2 in. broad; midrib slender; main nerves 5 to 6 pairs, curving upwards to the margin; reticulations netted; petiole slender, 5 to 7 in. long, the upper part bordered by the decurrent margins of the blade. Spikes

globose, '25 to 1 in. in diam.; peduncles 1 to 1.5 in. long, hispid; bracts lanceolate, '25 in. long; flowers of various colours, orange, red, and white. Calyx very small, slightly 2-lipped, pubescent. Corolla-tube slender, pubescent, '2 to '4 in. long; lobes rounded, spreading. Filaments very short; anther-cells unequal. Drupe ovoid, black, shining, '1 to '2 in. in diam.; pyrenes rounded. Bot. Mag. t. 96; Dalz. & Gibs. Suppl. 68; Trimen Fl. Ceyl. III. 346. L. Camara, Linn. l.c.; Schauer in DC. Prodr. XI. 598; Hook. f. Fl. Br. Ind. IV. 562; Cooke Bomb. Fl. II. 419; Prain Beng. Plants 825; Baker in Dyer Fl. Trop. Afr. V. 275.

PENANG: Curtis; Deschamps. PROVINCE WELLESLEY: G. King. SINGAPORE: Deschamps.—DISTRIB. Native of Tropical America, now widely spread in many regions of the Old World and very troublesome from its quick and strong matted growth.

2. LIPPIA, Linn.

Shrubs or undershrubs, rarely herbs, usually more or less hairy. Leaves opposite, ternate or verticillate, rarely alternate; entire dentate or lobate. Flowers small, in elongate or cylindrical or capitulate spikes; bracts small, imbricate; bracteoles none. Calyx small, membranous, 2- to 4-lobed, ultimately 2-valved, enclosing or sometimes adhering to the fruit. Corolla more or less hypocrateriform; tube cylindrical, straight or curved; limb oblique, more or less bilabiate; upper lip bifid, emarginate or 2-lobed; lower lip 3-lobed. Stamens 4 didynamous, included in the corolla-tube and inserted at its middle; anthers ovate with parallel cells. Ovary 2-celled; ovule solitary in each cell, erect from the base or laterally attached near the base of the cell; style short; stigma capitate, oblique or recurved, thickened. Fruit small, with a dry epicarp; mesocarp granular; endocarp hard, bony, easily separating into two 1-seeded pyrenes. Seed exalbuminous; radicle inferior.—DISTRIB. About 100 or more species, chiefly Tropical American, with a few African and only very few Asiatic.

LIPPIA NODIFLORA, Michx. Fl. Bor. Amer. II. 15 (1803). A creeping perennial herb; stems rooting at the nodes, much branched, subquadrangular, channelled, more or less clothed with appressed, medifixed, white hairs, often glabrous. Leaves opposite, subsessile, spathulate, rounded at apex, cuneate at base; both surfaces appressedly hairy with medifixed white hairs; upper half deeply and sharply serrate, lower entire; '75 to 1.25 in. long, '25 to '75 in. broad; midrib prominent; main nerves 3 to 4 pairs, straight. Spikes dense, globose at first, afterwards gradually elongating to oblong in fruit, '25 to '5 in. long; peduncles 1 to 3 in. long, usually from only one axil of each pair

of leaves, slender, quadrangular, channelled; bracts much imbricate, variable, 1 to 2 in. long, lower broadly ovate, upper narrowly cuneate, all acuminate with more or less hyaline fimbriate margins; flowers small, pale blue, pink, or white. Calyx 2-lobed; lobes lanceolate, pubescent. Corolla-tube slender, 1 in. long; limb 2-lipped, lower lip 3-lobed, midlobe obtuse. Stigma capitate. Fruit .05 to .075 in. long, glabrous, ovoid; epicarp bony, membranous; mesocarp granular; endocarp separating in two plano-convex pyrenes. Seed elliptic; testa membranous; cotyledons fleshy. Schauer in DC. Prodr. XI. 585; Wight Ill. t. 173 b, fig. 2, and Ic. t. 1463; Dalz. & Gibs. Bomb. Fl. 198; Clarke in Hook. f. Fl. Br. Ind. IV. 563; Mig. Fl. Ind. Bat. II. 905; Trimen Fl. Ceyl. III. 347; Cooke Bomb. Fl. II. 420; Prain Beng. Plants 825; Baker in Dyer Fl. Trop. Afr. V. 279. Verbena nodiflora, Linn. Sp. Pl. 20; Burm. Fl. Ind. 12, t. 6, fig. 1; Roxb. Hort. Beng. 4. Blairia nodiflora, Gaertn. Fruct. I. 266, t. 56. Zapania nodiflora, Lamk. Ill. t. 17; Wall. Cat. 1824. Latana sarmentosa and repens, Spreng. Syst. II. 752. Phyla chinensis, Lour. Fl. Cochinch. 66.

Penang: at Sangie Penang, Curtis 3520. Province Wellesley: Curtis 2208. Singapore: Kunstler 1198, in grassy and sandy places near the coast.—Distrib. India, Malay Archipelago, Africa and most tropical and subtropical regions.

3. STACHYTARPHETA, Vahl.

Herbs or shrubs. Leaves usually opposite, toothed, usually rugose. Flowers in terminal spikes in the axils of bracts, the rachis often hollowed out beneath each flower; bracts lanceolate, long or short; bracteoles none. Calyx elongate, narrowly cylindrical, shortly 4- to 5toothed, variously slit at a late stage. Corolla hypocrateriform; tube slender, cylindrical, usually curved; limb spreading, 5-lobed; the lobes equal or unequal, rounded. Stamens 2 perfect (the anticous ones), included in the corolla-tube, affixed above the middle; filaments short; anther-cells vertically divaricate; staminodes (posticous) 2 or 0. Ovary 2-celled; ovules solitary in each cell, attached laterally near its base; style long, filiform, exsert; stigma capitate. Fruit cylindrical, included in the calyx, separating into 2 bony 1-seeded pyrenes. Seeds oblong; testa membranous; albumen none; cotyledons fleshy; radicle inferior.—Distrib. About 40 species, mostly Tropical American, a few African; the Indo-Malayan species probably introduced and run wild.

1. STACHYTARPHETA JAMAICENSIS, Vahl Enum. I. 206 (1805). An

annual erect branched herb, reaching 1 to 3 ft. high; stems dichotomously branched, nearly quadrangular. Leaves opposite, elliptic, obtuse or acute at apex, cuneate at base and decurrent, upper twothirds coarsely serrate, lower cuneate portion entire; both surfaces glabrous or nearly so; 1 to 4 in. long, 1 to 1.5 in. broad; midrib slender; main nerves slender, 4 to 6 pairs, curved upwards; petiole obscure, being winged by the decurrent margins of the blade. Spikes elongate, 3 to 12 in. long, slender; rachis up to 15 in. in diam., conspicuously excavated to hold the flowers, the hollows closed by the bracts; bracts lanceolate, acuminate, scarious and ciliate on the margins, 15 to 2 in. long; flowers blue. Calyx 25 in. long, membranous, glabrous, 4- to 5-toothed, usually slit on one side (that in the hollow of the rachis). Corolla-tube curved outwards, 3 to 5 in. long; limb spreading, 5-lobed. Fruit dry, 15 in. long, tipped with the slender remains of the style; pyrenes plano-convex, very hard. Bot. Mag. t. 1860. S. indica, Vahl, l.c.; Clarke in Hook. f. Fl. Br. Ind. IV. 564; Trimen Fl. Ceyl. III. 348; Cooke Bomb. Fl. II. 421; Prain Beng. Plants, 826; Baker in Dyer Fl. Trop. Afr. V. 284. S. urticifolia, Dalz. & Gibs. Bomb. Fl. Suppl. 68. Stachytarpha jamaicensis, Schauer in DC. Prodr. XI. 564. S. indica, Schauer in DC. l. c.; Mig. Fl. Ind. Bat. II. 907. Verbena jamaicensis, Linn. Sp. Pl. 19; Roxb. Hort. Beng. 4. V. indica, Linn. Sp. Pl. ed. 3, 27; Wall. Cat. 2656.

Penang: common by roadsides, G. King; on Government Hill, Curtis. Perak: at Panjsore, Scortechini 996. Johore: Marius, Jensen. Singapore: Cuming 2406; in waste places, Deschamps; Kunstler (King's Collector) 173, 1149.—Distrib. India, Ceylon, Malay Archipelago, Tropical Asia and Africa; in Malaya probably introduced and run wild.

2. Stachytarpheta mutabilis, Vahl Enum. I. 209 (1805). A stout branching pubescent herb, reaching 3 ft. high or more; stems quadrangular, densely tawny-pubescent. Leaves opposite, ovate acute at apex, rounded at base and decurrent; upper three-fourths broadly crenate, the crenatures mucronate, basal part entire; upper surface sparsely villous and scabrid, lower softly grey-tomentose; 3 to 5 in. long, 1·5 to 2·5 in. broad; midrib stout; main nerves 6 to 8 pairs; petiole 1·5 to 1 in. long, almost entirely bordered by the decurrent margins of the blade. Spikes stout, elongate, 6 to 18 in. long; rachis up to ·25 in. in diam., excavated vertically to hold the flowers, the hollows closed by the bracts; bracts ovate-lanceolate, cuspidate-acuminate, strigosely hairy, ·25 to ·5 in. long; flowers pink. Calyx ·4 to ·5 in. long, strigosely pubescent, 4-toothed on the outer side, cleft on the inner, the teeth acute. Corolla-tube curved outwards, up to 1 in. long, slightly

dilated at the throat; limb spreading, lobes 5 rounded. Anther-cells ·05 in. long; filaments villous; staminodes subulate, villous, ·15 to ·2 in. long. Fruit oblong, ovoid or somewhat pyriform, tipped with the long remains of the style; pyrenes plano-convex, very hard, ·2 to ·25 in. long. Seed oblong, ·15 in. long; testa membranous; cotyledons obovate, ·1 in. long, fleshy. Schauer in DC. Prodr. XI. 565; Bot. Mag. t. 976; Cooke Bomb. Fl. II. 422; Baker in Dyer Fl. Trop. Afr. V. 284. Verbena mutabilis, Jacq. Coll. 2, 334; Icon. Rar. 2, 207; Andr. Bot. Rep. t. 435.

Penang: Curtis 867; Birch; Ridley 7044. SINGAPORE: in waste places, Deschamps.—Distrib. A native of Tropical America, widely spread in the Old World, e.g., Southern India, Java, Central Africa

Tribe II. VITICEÆ.

4. Geunsia, Blume.

Trees or large shrubs, stellately tomentose. Leaves opposite or occasionally alternate by the separation of the leaves of a pair, petiolate, Flowers small, in many-flowered pedunculate cymes in the upper axils of the branchlets; bracts linear, small. Calyx campanulate, shortly 5- to 6-toothed. Corolla campanulate; tube exsert, funnel-shaped; lobes 5, spreading. Stamens 5 to 6; anthers oblong, exserted, glandular, dorsifixed; cells parallel, dehiscing longitudinally but more widely at tip; filaments slender. Ovary imperfectly 5-, rarely 4- to 3-celled; the cells 2-ovulate; the ovules fixed laterally above the middle of the cell; style exsert, stout; stigma 5- or less lobed, dilated. Drupe small, globose, depressed, on the persistent not enlarged calyx; exocarp thin; mesocarp granular; endocarp hard; pyrenes 5 to 10, equal in number to the ovules, 1-seeded. small, oblong-ovoid; testa thin; albumen none; cotyledons fleshy; radicle inferior.—DISTRIB. 3 to 4 species, of the Malay Peninsula and Archipelago.

Geunsia farinosa, Blume Bijdr. 819 (1826). A large tree, reaching 60 to 70 ft. in height and a considerable diameter; the upper branches, inflorescence, and under surface (also upper surface when young) of leaves covered more or less densely with stellate furfuraceous pale brown tomentum, and also often with minute rounded glands. Leaves coriaceous, ovate or elliptic-oblong, long cuspidate-acuminate at apex, rounded or subacute at base; upper surface when young farinose, later glabrous; lower surface rugose; margin entire or minutely denticulate, 5 to 9 in. long, 2 to 4 in. broad; midrib prominent; main nerves 10 to

12 pairs obliquely curved upwards and joined by many more or less parallel transverse nerves; reticulations close; petiole stout, 1 in. long, channelled above, the opposite ones joined by a raised line. Cymes rounded, dichotomously branched, 1.5 to 2 in. broad; peduncles 1 to 1.5 in. long: bracts subulate, 15 to 2 in. long; pedicels very short; flowers reddish-purple. Calyx 06 in. deep. glabrous within. Corollatube 1 to 2 in. long, glandular; lobes recurved, 05 in. long, rounded. Stamens exserted; filaments a little longer than the corolla-tube; anthers 1 in. long, very glandular on the back. Drupe reddish-black when ripe, 15 in. broad, 1 in. in diam., top depressed. Clarke in Hook. f. Fl. Br. Ind. IV. 566; Bocquillon Revis. Verben. 89, t. 8; Koord. & Valeton Bijdr. VII. 173. G. Cumingiana, Rolfe in Journ. Linn. Soc. XXI. 315. Callicarpa pentandra, Roxb. Fl. Ind. I. 395; Wall. Cat. 1836; Schauer in DC. Prodr. XI. 646; Mig. Fl. Ind. Bat. II. 885. C. acuminatissima, Teysm. & Binn. in Batav. Nat. Tijdschr. XXV. 409. C. Cumingiana, Schauer, l. c. 644.

Kedah: on Langkawi Island, Curtis 2552. Perak: King's Collector 859, 972 (part), 5731, 8547. Selangor: at Batu Tiga, Curtis 3767; at Ginting Bidai, Ridley 7599; at Rawang, Ridley 10494. Singapore: Wallich 1836.—Distrib. Java (Forbes 315, 375, 539, 602; Kollman; Koorders 15204b), Borneo (Beccari 786; Haviland 554, 1343, 3553; Motley 385), Amboina, Philippine Islands, &c.

The following Bornean species seems to be undescribed:-

GEUNSIA HAVILANDII, King & Gamble in Kew Bull. 105 (1908). A tree (?); branches, inflorescence, and under surface of leaves densely tawny-stellate-pubescent and strigosely hairy. Leaves opposite, ovate or ovate-oblong, shortly acuminate and mucronate at apex, acute or cuneate at base; upper surface strigosely scabroushispid on the upper surface, especially on the midrib; lower surface rugose, stellatepubescent and studded with peltate glands; margins rather distinctly denticulate; 2.5 to to 6 in. long, 1.5 to 2.5 in. broad; midrib stout, prominent; main nerves 9 to 11 pairs, prominent beneath, gently curving upwards to anastomose near the margin, joined by conspicuous transverse nervelets; reticulations netted; petiole stout, tawnyhispid. 5 to 75 in. long. Cymes axillary, few-flowered, subsessile, scarcely longer than the petiole; bracts very small, subulate; pedicels slender, short. Calyx campanulate, glabrous within, without very strigosely hispid; teeth 5, minute in bud, afterwards elongating to 05 in. long. Corolla campanulate, nearly glabrous except for peltate shining glands; tube 1 in. long; lobes 5, ovate, rounded, about 075 in. long, recurved in flower. Stamens exserted; filaments slender, glabrous; anthers 1 in. long, oblong, prominently yellow-glandular on the back. Ovary thickly glandular, depressed; style slender, 2 in. long; stigma shortly 5-lobed. Drupe reddish-black when dry, 15 in. in diam., top depressed, dividing into 5 pyrenes; fruiting calyx flattened.

BORNEO: at Sarawak, Beccari 3240; Haviland 3549 k and L: near Kuching, Haviland 889.

We are a little in doubt whether this is the G. Beccariana, Briquet in Engl. & Prantl Nat. Pflanzenfam. IV. 3 and 165, of which we can find no description. We think, however, that Briquet's G. Beccariana is Beccari 2759, a beautiful species from Sarawak with long tawny hair.

5. CALLICARPA, Linn.

Trees or shrubs, more or less clothed with stellate or farinose tomentum, with or without glandular scales, rarely quite glabrous. Leaves opposite, rarely ternately whorled; crenulate serrulate or rarely entire, in one species lobed. Flowers small, white red or purple, in axillary sessile or pedunculate, usually many-flowered, cymes; bracts linear, inconspicuous. Calyx very small, shortly campanulate, truncate or minutely 4-lobed, unaltered in fruit. Corolla small, campanulate or tubular; tube twice as long as the calyx or less; lobes 4, oblong, erect or spreading. Stamens 4 equal, inserted at about the middle of the tube or lower, sometimes at the base; filaments slender, exsert; anthers ovate or oblong, dorsifixed; the cells parallel, both sides usually prominently glandular. Ovary imperfectly 2-celled; cells 2-ovuled; style elongate; stigma dilated, shortly and obscurely bifid; ovules attached at the middle of the cell or higher. Fruit a small globose drupe, supported by the persistent calyx; exocarp thin; mesocarp fleshy; endocarp bony, of 4 or fewer pyrenes, convex on the back. flattened on the sides. Seeds small, oblong; testa membranous; albumen none or evanescent; cotyledons fleshy; radicle inferior.—DISTRIB. About 30 species, of Tropical and Subtropical Asia, to Japan, Australia and Polynesia; also in Central America and the West Indies.

Lower surface of leaves covered with dense stellate tomentum. without or with very few glandular dots; margins of leaves entire or nearly so :--Leaves broad, more or less elliptic; cymes long, manyflowered :-

Leaves long-acuminate, tomentum thick; cymes dense; corolla-tube only about .075 in. long, merely puberulous 1. C. arborea. Leaves obtuse or very shortly acuminate, tomentum thin; cymes spreading; corolla-tube ·1 in. long, stellate-pubescent Leaves narrow, lanceolate; cymes short, few-flowered; corollatube 15 in. long, stellate-pubescent ..

Lower surface of leaves densely grey stellate-flocculose, with many glandular dots on both surfaces; margins of leaves serrate:-

Cymes spreading, reaching 3 to 4 in. in diam.; upper surface of leaves glabrate, lower densely grey-flocculose Cymes dense, rounded, rarely 1 to 2 in. in diam .:-

Upper surface of leaves glabrate, lower whitish-grey, stellately tomentose

2. C. Maingayi.

3. C. angustifolia.

.. 4. C. Reevesii.

.. 5. C. cana.

Upper surface of leaves hispid-puberulous, lower thinly greystellate-tomentose 6. C. pedunculata. Lower surface of leaves sparsely stellate hairy, with many glandular dots; margins of leaves serrulate; cymes rounded, up to 2 in. broad 7. C. longifolia.

1. CALLICARPA ARBOREA, Roxb. Hort. Beng. 10 (1814), and Fl. Ind. I. 390 (1832). A tree reaching 40 ft. in height, with thick trunk and round head; branches stout; branchlets thick, obtusely quadrangular, covered with dense grey-tawny, forked, stellate or mealy tomentum, as are the young leaves and inflorescence. Leaves coriaceous; ovate or elliptic-ovate, acuminate at apex, long acute or cuneate at base; upper surface when young with mealy soft stellate-tomentum, afterwards glabrous, lower closely tawny-stellate tomentose; margins entire or sometimes distantly denticulate; 6 to 12 in. long, 2 to 5 in. broad; midrib very stout, much raised beneath; main nerves stout, 8 to 14 pairs. raised beneath and joined by fairly regular transverse raised nervules, the main nerves starting at an angle of about 55° with the midrib and curving gently to the margin, where they anastomose; petiole stout, 1 to 2.5 in. long, channelled above. Cymes very many-flowered, widely dichotomously branched many times, reaching 6 in. in length and about 5 in. in breadth; peduncles 1 to 3 in. long; bracts linear-subulate, ·25 in. long or less; pedicels very short; flowers red or purple. Calyx ·05 in. long, truncate and minutely 4-toothed at mouth, glabrous within. Corolla-tube 075 in. long, puberulous without; lobes 4, reflexed, subquadrate, as long as tube, villous without. Stamens long, exsert: anthers glandular-punctate on the back. Ovary villous; style much exsert, bent outwards, enlarged upwards; stigma peltate at first, then broadly funnelshaped. Drupe 15 to 2 in. in diam., succulent, purple, ultimately black; pyrenes 4 or less. Wall. Cat. 1826 chiefly. Schauer in DC. Prodr. XI. 641; Brandis For. Fl. 368; Kurz For. Fl. II. 274; Clarke in Hook. f. Fl. Br. Ind. IV. 567; Prain Beng. Plants 827. C. tectonæfolia, Wall. Cat. 1827.

Kedah: at Campong Yan, Ridley 5607. Penang: Tanjong Bunga, Curtis 699; Batu Gaja jungles, Deschamps. Perak: Wray 1824, 3957; at Bruas Dindings, Ridley 7179; Scortechini; King's Collector 972 (part).—Distrib. India (Kumaon to Assam, Sonthal Parganas. Chota Nagpore, Eastern Bengal), Burma, Sumatra (Teysmann 4388; Forbes 1530, 2601).

VAR. villosa, Roxb. Hort. Beng. 10 (species). Leaves 6 to 8 in. long, 3.5 to 4.5 in. broad, ovate, caudate-acuminate at apex, rounded and then slightly decurrent at base. Tomentum of branchlets, young leaves, and inflorescence very thick and pale, chiefly consisting of

branched hairs. This var. resembles *C. lanata*, Linn., of Southern India and Ceylon in its leaves, but the flowers are those of *C. arborea*.

Perak: Scortechini.

2. CALLICARPA MAINGAYI, King & Gamble in Kew Bull. 106 (1908). A tree; young branches, inflorescence, and leaves beneath covered with minute golden-brown stellate tomentum; branchlets stout, obtusely quadrangular. Leaves coriaceous, elliptic or elliptic-obovate, rounded and very shortly acute or acuminate at apex, rounded and then somewhat cuneate at base, the two sides often unequal; upper surface glabrous except the midrib and main nerves of young leaves; lower surface rugose and very minutely appressed stellate-pubescent; margins entire or undulate with minute denticulations at the ends of the nerves; 6 to 12 in. long, 3 to 6 in. broad; nerves all impressed on the upper surface, sharply and strongly raised on the lower; the midrib stout; main nerves 10 to 12 pairs, starting at about 75° with the midrib and curving upwards to anastomose near the margin, the pairs joined by fairly regular transverse nervules, and these again by the netted reticulations; petiole 1.5 to 2 in. long, stout, channelled above. Cymes manyflowered, rounded, reaching 3.5 in. long and 6 in. broad, widely dichotomous; peduncle stout, flattened, 1 to 1.5 in. long, further branchpeduncles also flattened when dry; bracts linear-subulate, very small; pedicels 05 to 1 in. long, slender. Calyx hemispherical, 05 in. long, tawny stellate-pubescent without, glabrous within, with 4 minute teeth. Corolla-tube nearly cylindric, 1 in. long, densely and closely greystellate-tomentose without, nearly glabrous within; lobes short, rounded. erect or slightly recurved, '04 in. long, villous within. Stamens inserted at 04 in. from base of tube; filaments 175 in. long; anthers oblong, ·075 in. long, glandular-punctate on the back. Ovary villous; style slender, bent; stigma broad, peltate. Drupe small, black, 06 in. in diam. (immature).

Selangor: Ridley 2787. Malacca: Maingay (K.D.) 1192; at Hulu Chembong, Derry 1005, Vern. "Tampang Besi."

In Kew Herbarium, Maingay's specimen has been placed under *C. arborea*, but the species differs in many respects. The venation of the leaves is very different, as is the tomentum of much smaller stellate hairs; the leaves are nearly blunt; the tube of the corolla much longer, and its lobes much shorter; and we have no hesitation in describing it as a new species.

3. Callicarpa angustifolia, King & Gamble in Kew Bull. 106 (1908). A shrub, reaching 8 to 9 ft. in height; branchlets, inflorescence, and leaves beneath (also young ones above) clothed with appressed grey or ferruginous stellate tomentum; branchlets obscurely quadran-

gular. Leaves subcoriaceous; lanceolate, attenuately acute at apex, long attenuate at base and decurrent; upper surface dark, glabrous except when young; lower densely tomentose, grey-tawny or silvery; margins entire or rarely obscurely denticulate, slightly recurved; 4 to 7 in. long, .75 to 1.5 in. broad; midrib stout, impressed above, prominent beneath; main nerves 9 to 15 pairs, rather irregular, starting at from 60° to 70° with the midrib and at once curving upwards to and along the margin, joined by subparallel transverse nervules; petiole 5 to 75 in. long, the bases of the opposite leaves joined by a well-marked ridge. Cumes few-flowered, 5 to 75 in. long and about 75 in. broad, widely dichotomous; peduncles 25 to 35 in. long; bracts linear-subulate; pedicels very short, jointed; flowers bluish-pink. Calyx campanulate, 075 in. long, densely stellate-tomentose without, glabrous within; teeth mucronulate. Corolla about twice as long as calyx, densely stellate-tomentose without, glabrous within; lobes rounded, erect. Stamens inserted at or very near the base of the corolla-tube; filaments slender, 15 in. long, scarcely or not exsert; anthers 06 in. long, oblong, much glandular-dotted on both sides. Ovary villous; style slender, exsert; stigma capitate. Drupe glabrous, globose, 1 in. in diam., dark blue when ripe; pyrenes 4.

KEDAH: on Langkawi Island, Ridley 8330. PERAK: at Ipoh, Curtis 3197; at Batu Kuran, Scortechini 1596; on the top of limestone hills 600 to 1000 ft., King's Collector 7036, 8236.

The Kedah specimens have narrower leaves than the rest, with more slender branchlets. The species comes near to *C. angusta*, Schauer, from the Philippines, but differs in the almost quite entire leaves and larger flowers and fruit.

4. Callicarpa Reevesh, Wall. Cat. 1830 (1828). A shrub; the branches, petioles, under surface of leaves, and inflorescence covered with a soft, whitish-grey or pale tawny, mealy tomentum of branched or stellate hairs. Leaves coriaceous; lanceolate or elliptic-lanceolate, long acute at apex, attenuate at base and often slightly unequal, not decurrent; upper surface dark when dry, glabrous except the nerves, lower tomentose; margins entire for the lower third, above that shortly dentate-serrate; 5 to 8 in. long, 2 to 3 in. broad; midrib stout; main nerves 13 to 15 pairs, nearly regular, starting at an angle of 45° to 60° with the midrib and curving gently to the margin, each pair joined by rather obscure transverse nervelets, all slightly impressed above; petiole '75 in. long. Cymes axillary, rounded, many-flowered, widely dichotomous, reaching 4 in. long and about 3 in. broad; peduncles 1.5 to 2 in. long; bracts linear subulate, '1 in. long; pedicels short, slender, nearly glabrous, '05 to '1 in. long; flowers purple? Calyx very

short, nearly glabrous but with a few stellate hairs and minutely glandular-punctate, very shortly 4-toothed. Corolla twice as long as calyx, '1 in.; lobes rounded, sparsely stellate-pubescent and glandular-punctate. Stamens long exsert; filaments slender; anthers small; the connective glandular-punctate. Ovary rounded, very glandular; style very long, twisted; stigma peltate, large. Drupe purple, small, '075 to '1 in. in diam., nearly globose; pyrenes 4. Schauer in DC. Prodr. XI. 641; Benth. Fl. Hongk. 270; Clarke in Hook. f. Fl. Br. Ind. IV. 568. C. nudiflora, Hook, and Arn. Bot. Beech. Voy. 206, t. 46.

SINGAPORE: near the Botanic Gardens, Murton 87; Ridley 6884 cult.!—DISTRIB. Tenasserim (?) (Falconer); Southern China.

5. CALLICARPA CANA, Linn. Mant. 198 (1771). A shrub; branchlets, leaves beneath, and inflorescence covered with a down of whitish or grey or cinnamomeous stellate hairs; branchlets obtusely quadrangular. Leaves membranous; ovate, ovate-elliptic or ovate-lanceolate, shortly acuminate at apex, cuneately attenuate at base; upper surface stellatetomentose when young, afterwards glabrous, shining and dark-coloured, glandular-punctate; lower more or less whitish-grey stellate-tomentose, sometimes glabrescent, sometimes rugose, but more usually softly and conspicuously hairy, glandular-punctate beneath the tomentum; margins glandular-serrate, except at the cuneate base; 4 to 7 in. long, 2 to 3 in. broad; midrib rather slender, pubescent above; main nerves 10 to 12 pairs, impressed above, slightly raised beneath, starting at an angle of 40° to 45° with the midrib and curving upwards to the margin, joined by regular transverse nearly parallel nervules; reticulations netted. impressed above; petiole 25 to 75 in. long, upper part bordered by the decurrent margins of the blade. Cymes many-flowered, rounded, scarcely longer than the petioles, dichotomous; peduncles about 25 in. long; bracts linear-subulate, very small; pedicels very short; flowers Calyx densely white-stellate-tomentose without, glabrous within, 05 in. long; teeth very minute. Corolla campanulate; tube glabrous, 075 in. long; lobes rounded, 025 in. long, slightly whitevillous without. Stamens inserted close to the base of the tube; filaments much exsert, twisted, 15 in. long; anthers 02 in. long; the connective glandular-punctate. Ovary somewhat depressed; style decurved, often twisted, as long as filaments; stigma funnel-shaped. Drupe globose, under 1 in. long in diam., purple; pyrenes 4. Vahl Symb. III. 12; Roxb. Fl. Ind. I. 392; Wall. Cat. 1834; Blume Bijdr. 817: Done in Nouv. Ann. Mus. III. 401; Schauer in DC. Prodr. XI. 643: Miq. Fl. Ind. Bat. II. 885; Benth. Fl. Austral. V. 56; Clarke in Hook. f. Fl. Br. Ind. IV. 568. C. tomentosa, Lamk. Diet. I. 562. C. americana. Lour. Fl. Cochinch. 70, not of Linn. C. adenanthera, Br. Prodr. 513.

C. Heynei, Roth Nov. Sp. 82; Blume Bijdr. 819. C. bicolor, Juss. in Ann. Mus. VII. 77; Schauer in DC. l. c. 642. C. sumatrana, Miq. l. c. 886. C. dentata, Herb. Roxb., Wall. Cat. 1834, not of Roth.

Penang: Wallich 1834; Porter; Phillips. Negri Sembilan: Port Dickson, Sungei Ujong, Ridley 9574. Malacca: Maingay (K.D.) 1190; Griffith; Ridley 1589. Singapore: Kurz 2908.—Distrib. Malay Archipelago, Philippine Islands, Australia.

Clarke in Fl. Br. Ind. does not quote Bot. Mag. 2107, which Bentham had said probably represented a much more woolly plant, though it might be a var. of cana. With this we agree.

6. Callicarpa pedunculata, Br. Prodr. Fl. Nov.-Holl. 513 (1810). A shrub with rather loose tomentum; branchlets stellate-pubescent. Leaves membranous; ovate, cuspidate-acuminate at apex, rounded at base; upper surface hispid-puberulous above, especially on the nerves. lower surface thinly whitish-grey stellate-tomentose; margins serrulate on the upper two-thirds; 3 to 6 in. long, 1.5 to 3 in. broad; midrib slender, main nerves about 10 pairs, curving gently upwards to the margin; transverse nervules many and rather prominent; petiole 25 to 5 in. long. Cymes rather dense, globose, stellately woolly, on peduncles ·25 to ·75 in. long; bracts and bracteoles linear subulate; pedicels extremely short. Calyx campanulate, about 03 in. long, stellatepubescent and glandular; teeth short, thick. Corolla funnel-shaped, ·125 in. long; tube nearly glabrous; teeth rounded puberulous within. Stamens inserted at the base of the tube; filaments long exsert, slender; anthers elliptic-reniform, the connective prominently gland-dotted. Ovary rounded, glabrous, glandular; style very long; stigma thick, capitate. Drupe dark purple, globose, 1 in. in diam.; exocarp smooth. Benth. Fl. Austral. V. 57; Clarke in Hook. f. Fl. Br. Ind. IV. 569. C. cuspidata, Roxb. Fl. Ind. I. 394. C. dentata, Roth Nov. Sp. 81; Blume Bijdr. 818; Wall. Cat. 6319. C. cana, Wall. Cat. 1834, No. 2. C. lanata, Schauer in DC. Prodr. XI. 644, not of Linn. or of Vahl. C. tiliæfolia, Teysm. & Binn. fide Kurz MS.

Penang: Wallich 1834,2, 6319.—Distrib. Malay Archipelago, Tropical Australia.

7. Callicarpa longifolia, Lamk. Dict. I. 563 (1785), and Ill. t. 69 (1791). A shrub, reaching 5 to 6 ft. in height; branchlets, inflorescence, and leaves beneath rather sparsely covered with a short grey or tawny tomentum of stellate hairs; branchlets obtusely quadrangular, slender. Leaves membranous; lanceolate, ovate-lanceolate or occasionally oblong-lanceolate, long acuminate at apex, acuminately narrowed at base or rarely almost rounded; upper surface nearly glabrous, lower also some-

times glabrescent, more usually sparsely stellate-hairy; both surfaces gland-dotted; margins serrulate except near the base; 3 to 7 in. long, 1.5 to 3 in. broad; midrib slender but prominent beneath; main nerves 10 to 12 pairs, starting at an angle of 50° to 60° with the midrib and curving upwards to and along the margin, joined by regular parallel transverse nervelets, all nerves and midrib more or less pubescent: petiole 5 to 1 in. long, slender. Cymes dichotomously divaricate-branched, rounded, 1 to 1.5 in. long, and up to 2 in. broad; peduncles .35 to .5 in. long; bracts linear-subulate; pedicels slender, short, glabrescent in fruit; flowers pale blue, purplish, pink or white (Benth. in Fl. Austral.). Calyx campanulate, 05 in. long, glandular-dotted and sparsely stellatehairy; teeth 4, mucronulate. Corolla nearly twice as long as calyx, pubescent without, glabrous within; lobes rounded, erect or incurved, about 025 in. long. Stamens inserted at the very base of the tube; filaments long exsert, slender, twisted; anthers ovate-orbicular; the connective prominently gland-dotted. Ovary villous; style long, curved, often deflexed; stigma funnel-shaped. Drupe white, depressed, glandular, 05 to 07 in. in diam.; pyrenes 4. Bot. Reg. t. 864; Roxb. Fl. Ind. I. 394; Brandis For. Fl. 369; Kurz For. Fl. II. 275; Schauer in DC. Prodr. XI. 645, Var. β floccosa; Benth. Fl. Austral. V. 57; Miq. Fl. Ind. Bat. II. 887; Koord. & Val. Bijdr. I. 176; Clarke in Fl. Br. Ind. IV. 570. C. Roxburghiana, Roem & Sch. Syst. III. Mant. 54. C. attenuata, Wall. Cat. 1835. C. cana, Wall. Cat. 1834 (partly). C. dentata, Wall. Cat. 6319 (partly).

Kedah: on Langkawi Island, Curtis 2134. Penang (or Singapore): Wallich 1835. Penang: at waterfall and half-way up hill, G. King; Stoliczka. Perak: Scortechini 1214; King's Collector (Kunstler) 80, 239. Malacca: Griffith (K.D.) 6039; Maingay (K.D.) 1191. Selangor: Curtis. Johore: at Jaffaria, G. King. Singapore: Lobb; Hullett; Cantley 120; Schomburgk 54; G. Thomson 44; Walker 207; Deschamps (cult.).—Distrib. Java, Sumatra, Borneo, to North Australia.

6. TECTONA, Linn. f.

Trees, stellately tomentose. Leaves opposite or whorled, large, entire, petioled. Flowers in dichotomous many-flowered cymes, in large terminal panicles; bracts small, narrow. Calyx campanulate, shortly 5- to 6-lobed, enlarged and becoming bladder-like in fruit and then ovoid or urceolate. Corolla small, white or bluish; tube short; limb with 5 to 6 short subequal spreading imbricate lobes. Stamens 5 to 6, attached near the base of the corolla-tube, equal, exserted;

anthers ovate or oblong with distinct parallel cells. Ovary fleshy, 4-celled; each cell 1-ovuled, ovules attached near their bases to the axis; style linear; stigma shortly bifid. Fruit a drupe enclosed in the accrescent calyx; exocarp spongy-suberose or almost none; endocarp bony, thick, 4-celled. Seeds erect, oblong; testa membranous; albumen 0; cotyledons fleshy and oily; radicle short, inferior.—Distrib. Species 3, one in India and Malaya, one in Burma, the third in the Philippine Islands.

TECTONA GRANDIS, Linn. f. Suppl. 151 (1781). A large deciduous tree; branchlets quadrangular, channelled, stellately tomentose, as are the young leaves, leaves beneath and inflorescence. Leaves coriaceochartaceous; ovate elliptic or obovate, acute or shortly acuminate at apex, rounded acute or cuneate often decurrent at base; upper surface stellate-tomentose when young, afterwards glabrescent, scabrous and punctate with round whitish glands, lower with grey or tawny stellate tomentum; margins entire; 1 to 2 ft. long, 6 in. to 1 ft. broad (leaves of seedlings and coppice shoots often much larger); midrib very stout, much raised beneath; main nerves 8 to 12 pairs, branched and curving upwards, joined by numerous prominent parallel transverse nervules; petiole 5 to 15 in. long, very stout, rounded below, the bases of opposite petioles joined by a prominent ridge. Panicles 1 to 3 ft. in length and breadth, much spreading, 2- to 3-chotomous; ultimate branches with a sessile fertile flower in the angle; peduncles quadrangular, 0 to 3 in. long; bracts lanceolate or spathulate, lower ones leafy, in pairs at the forks; pedicels very short; flowers white. Calyx in flower globose-campanulate, 125 in. long; lobes 5 or 6, 05 in. long, acute; calyx in fruit ovoid, ventricose, reticulate, often 1 to 1.5 in. in diam., with small teeth nearly closing the orifice. Corolla white, glabrous, 5 to 6-lobed; tube about 1 in. long; limb spreading; lobes subequal. Ovary densely hairy. Drupe subglobose, .5 to .75 in. in diam., indistinctly 4-lobed; pericarp soft, with dense felted stellate or branched hairs; endocarp thick, bony. Seeds obovoid; testa thin; cotyledons conform with the seed, fleshy; radicle very small. Gaertn. Fruct. I. 275, t. 57; Roxb. Cor. Pl. I. 10, t. 6, and Fl. Ind. I. 600; Wall, Cat. 772; Schauer in DC. Prodr. XI. 622; Dalz. & Gibs. Bomb. Fl. 199; Bocq. Rev. Verb. 99, t. 10; Bedd. Fl. Sylv. Madr. t. 250; Brandis For. Fl. 354, t. 44; Kurz, For. Fl. II. 259; Bl. Bijdr. 820; Mig. Fl. Ind. Bat. II. 901; Clarke in Hook. f. Fl. Br. Ind. IV. 570; Cooke, Fl. Bomb. II. 424; Prain Beng. Plants, 828; Koord. & Val. Bijdr. VII. 165; Briquet in Engl. & Prantl Nat. Pflanzenfam. IV. 3A, 167, "Theka," Rheede Hort. Mal. IV. 57, t. 27; Rumph. Herb. Amb. III, t. 18.

MALAY PENINSULA: Burma to Malacca, fide Fl. Br. Ind. &c.—DISTRIB. India, Burma, Siam, Sumatra, Java. The teak-tree, often cultivated (MALACCA: Maingay, (K.D.) 1193).

We include here the teak-tree, on the authority of the Fl. Br. Ind., but there are no specimens from the Malay Peninsula, from wild trees, in either of the herbaria of Kew or Calcutta. Mr. Ridley informs us that, so far as he is aware, the teak-tree is nowhere indigenous in the Malay Peninsula.

7. PREMNA, Linn.

Trees or shrubs, sometimes climbing. Leaves opposite or sometimes in whorls of 4, entire or toothed. Flowers in corymbose or panicled or sometimes thyrsoid, pubescent, terminal cymes; bracts small, narrow; bracteoles 0. Calyx small, campanulate, truncate, 2-lipped or shortly 2- to 5-toothed. Corolla small; tube short, often villous within; limb 2-lipped, 5-lobed or subequally 4-lobed. Stamens 4 didynamous, inserted below the throat of the corolla-tube, rarely exserted; anthers ovate or rounded, the cells parallel or divergent. Ovary 2- or 4-celled, 4-ovuled; style linear; stigma shortly bifid. Fruit a small drupe, surrounded below by the calyx, globose or obovoid; mesocarp thin, fleshy; endocarp of 1 pyrene, hard, undivided, 4-celled or by abortion 1- to 3-celled, with a central cavity. Seeds oblong; testa thin; albumen 0; cotyledons flat; radicle inferior.—Distrib. Species 40 or more, in the warmer regions of the Old World.

Calyx clearly 2-lipped:—	
Upper lip of calyx 3-lobed; lower 2-lobed:—	
Leaves prominently crenate-dentate, ovate or ovate-deltoid,	
cordate	1. P. littoralis.
Leaves entire or very obscurely and distantly toothed, ovate	2. P. flavescens
Upper lip of calyx 2-lobed:—	var. rubens.
Lower lip of calyx entire or obscurely lobed; corolla-tube	
funnel-shaped:—	
Cymes in panicles of interrupted spikes; leaves subsessile	3. P. Derryana.
Cymes in corymbose panicles: leaves petioled:—	
Corymbs small, under 2 in. in diam.; leaves under 3.5 in.	
long	4. P. integrifolia var. angustior.
Corymbs rather large, reaching 5 in. in diam.; leaves	
over 3 in. long.	
Corymbs lax:—	
Main nerves of leaves 6 to 8 pairs; leaves acuminate	
at apex, truncate or cordate at base; calyx-tube	
puberulous	5. P. fætida.

Main nerves of leaves 5 to 6 pairs; leaves obtuse	
or very shortly acute or acuminate at apex:—	
Leaves ovate or elliptic, membrano-chartaceous 6. P. divar	icata.
Leaves obovate or orbicular, chartaceous 7. P. trich	ostoma.
Leaves elliptic or elliptic lanceolate, coriaceo-	
chartaceous 8. P. pera	kensis.
Main nerves of leaves 4 to 5 pairs, leaves broadly	
elliptic 9. P. punct	tulata.
Corymbs compact:—	
Corymbs 3 in. in diam.; leaves membranous, ovate-	
acuminate, cordate or truncate at base, yellowish-	
brown when dry 10. P. cordi	folia.
Corymbs 4 to 5 in. in diam.; leaves coriaceous,	
elliptic or elliptic-lanceolate, shortly acuminate at	
apex, attenuate at base; reddish-brown when dry 11. P. Wra	yi.
Corymbs 8 in. in diam.; leaves membranous, broadly	
ovate, acuminate at apex, truncate or cordate at	
base; reddish-brown when dry 12. P. stered	ulifolia.
Lower lip of calyx 2-lobed, calyx-tube subquadrangular;	
leaves under 3 in. long; corymbs rather small; corolla-tube	
slender	eyi.
Calyx not 2-lipped:—	
Calyx truncate or very obscurely lobed; leaves coriaceous,	
elliptic, obtuse at apex, rounded at base	stleri.
Calyx subequally 5-lobed; leaves large, stellate tomentose, as	
are branchlets and inflorescence 15. P. pyra	midata.

1. Premna littoralis, King & Gamble in Kew Bull. 107 (1908). A small tree; branchlets nearly as thick as a goosequill, obscurely angled, tawny-pubescent, with small lenticels; the nodes marked by a ridge connecting the petioles. Leaves chartaceo-coriaceous; ovate or ovate-deltoid, acuminate at apex, cordate at base, the sinus 25 to 5 in. deep; both surfaces glabrous except the nerves, which are puberulous; margins acutely crenate-dentate except in the curves of the sinus; 4 to 6 in. long, 2 to 3 in. broad; midrib strong, raised beneath; main nerves 7 to 9 pairs, the lowest 1 to 2 pairs starting from the base and divaricate, the rest starting at an angle of about 50° with the midrib and curving upwards; transverse nervules distant, few, not prominent; petiole 1 to 1.5 in. long, slender, puberulous. Cymes in terminal, spreading, 3-chotomous, tawny-pubescent corymbs, reaching 4 in. in length and 6 in. in breadth; peduncles .75 to 1 in. long; primary branches up to 1.5 in. long, rest gradually shorter; bracts linear, persistent, the lowest sometimes leaf-like; pedicels very short, with a pair of minute bracteoles below the calyx; flowers very pale green. Calyx ·075 to 1 in. long, 2-lipped, upper shortly 3-lobed, lower longer, 2-lobed; lobes rounded; tube pubescent without. Corolla 2-lipped, half as long again as the calyx; upper lip broad, bifid, lower 3-lobed, the midlobe longest; all lobes rounded; tube glabrous without, also within except the belt of thick villous hairs just below the mouth. Stamens (in bud) included; filaments short, thick; anthers reniform, very shortly 1- to 2-mucronate. Ovary subglobose, depressed, glabrous except for a few glandular scales; style thick; stigma very shortly 2-fid. Drupe globose, glabrous, fleshy; endocarp tuberculate; cells 4, one only usually fertile. Seed oblong, acute at each end; testa membranous with a corky outer layer; cotyledons shortly oblong, obtuse, cordate, 05 in. long, fleshy.

PERAK: sea-coast at Matang, Wray 2719.

2. Premna flavescens, Ham.; Wall. Cat. 2649 (1828); Clarke in Hook. f. Fl. Br. Ind. IV. 578; Prain Beng. Plants, 831.

VAR. rubens, Clarke in Hook. f. Fl. Br. Ind. IV. 578 (1885). A shrub or small tree (a climber—Koorders & Valeton); branchlets the size of a crow-quill, grey-pubescent, obscurely angled. Leaves chartaceous when dry; ovate or ovate-oblong, acuminate at apex, cordate or rounded or somewhat cuneate at base; upper surface shining, sparsely setulose especially on the nerves, lower surface tawny-pubescent; entire or the upper half obscurely and distantly toothed; 4 to 6 in. long, 2 to 2.5 in. broad; midrib rather stout, raised beneath; main nerves 6 to 9 pairs, the lowest 1 or 2 (first very small) pairs from the base, at an angle of about 40° with the midrib, curving upwards to and along the margin, the upper ones joining in an intramarginal looped nerve which ends in the midrib at the acumination; transverse nervules many, conspicuous on the lower surface; petiole 1 to 1.5 in. long, slender, puberulous. Cymes in terminal tawny-pubescent corymbs about 4 in. in diam.; branches 3- then 2-chotomous; peduncle 1 to 2 in. long; bracts small, linear; pedicels short, under .05 in. long; flowers greenish. Calyx campanulate, 05 to 1 in. long, pubescent without, 2-lipped, upper lip 3-lobed, lower 2-lobed, all lobes obtuse, nearly equal; fruiting calyx saucer-shaped. Corolla funnel-shaped, 1 to 15 in. long, 2-lipped, upper lip shortly bilobed, reflexed, lower 3-lobed, the midlobe longest and oblong; tube much villous-hairy within. Stamens exsert; filaments flattened; anthers reniform, the cells nearly parallel. Ovary glabrous, depressed; style slender, as long as the stamens; stigma 2-lobed, the lobes slender, horizontally spreading. Drupe globose, 15 to 2 in. in diam., with numerous shining glands; endocarp tuberculate. oblanceolate, about 1 in. long, usually one only in each drupe; cotyledons fleshy, ovate-oblong; radicle thick. P. lucidula, Mig. Fl. Ind. Bat. II. 898; Koord. & Val. Bijdr. VII. 188.

Malacca: Ayer Punnas, Griffith (K.D.) 6020. — DISTRIB. Burma,

Java (Teysmann No. 10; Zollinger 645; Koorders 31425 β), Sumatra (Forbes 2621—a climbing shrub).

3. Premna Derryana, King & Gamble in Kew Bull. 107 (1908). A climbing (?) shrub; branchlets smooth, brown, with large circular or elliptic lenticels. Leaves membranous when dry, subsessile; elliptic or obovate, shortly and obtusely acute at apex, attenuate and obscurely auricled at base; both surfaces shining, glabrous; margins entire; 5 to 8 in. long, 3.5 to 4 in. broad; midrib slender, impressed above, raised beneath; main nerves 7 to 8 pairs, often branched, curving upwards to and along the margin where they anastomose; transverse nervules slender, and with the minor reticulations rather prominent. Cymes in terminal panicles of three to four spikes, each spike with many interrupted glomerules of sessile flowers, the inflorescence 6 to 8 in. long; main peduncles 2 to 2.5 in. long, secondary peduncles 75 to 1 in. long; bracts lanceolate, at the main divisions, 25 in. long. Calux deeply bilabiate; the upper lip entire at first, afterwards 2-lobed, 125 in. long, the lower one entire, 1 in. long; tube golden-pubescent without. Corolla-tube rather longer than the calvx, glabrous except for a few villous white hairs in the throat within; lips 2, posterior lip emarginate, erect, anterior lip 3-lobed, the lobes obtuse, the midlobe the longest. Stamens 4 long exsert; filaments puberulous, twisted; anthers reniform; cells opening by oblong pores. Ovary glabrous, depressed; cells 4, one only apparently seed-bearing; style slender, as long as the stamens; stigma of 2 slender horizontal lobes. Drupe not seen.

Perak: on Larut Hills, Derry (Curtis 3701).

4. PREMNA INTEGRIFOLIA, Linn. Mant. II. 252 (1771); Cooke Fl. Bomb. II. 426; Prain Beng. Plants, 830. P. serratifolia, Linn. l. c. 253; Schauer in DC. Prodr. XI. 632; Bedd. For. Man. in Flor. Sylv. CLXXII.; Trimen Fl. Ceyl. III. 352. P. spinosa, Roxb. Fl. Ind. III. 77. P. sambucina, Wall. Cat. 1775; Schauer, l. c. 631. "Gumira littorea," Rumph. Herb. Amb. III. 209, t. 134.

Var. angustior, Clarke in Hook. f. Fl. Br. Ind. IV. 574 (1885). A small shrub, 3 to 6 ft. in height; branchlets nearly glabrous, the size of a crow-quill, terete. Leaves elliptic or elliptic-ovate, obtusely acute at apex, rounded or narrowed at base; glabrous on both sides except on the midrib and main nerves; margins entire or obscurely crenatedentate in the upper half; 2 to 3.5 in. long, 1 to 2 in. broad; midrib slender, puberulous above and raised, tawny-villous along the sides and in the axils below; main nerves 4 to 5 pairs, lowest 2 pairs rather close to the base and long, the rest more spreading and curved upwards to join in an obscure intramarginal looped nerve; few transverse nervules and reticulations obscure; petiole slender, puberulous, 25 to 5 in. long.

Corymbs puberulous, terminal or pseudo-axillary in upper axils, up to 2 in. broad; sessile or on peduncles up to 1.5 in. long; branches at first 3- afterwards 2-chotomous; bracts minute, lanceolate; pedicels very short; flowers greyish-white. Calyx 2-lipped; upper lip with 2 triangular lobes, lower obtuse, obscurely 2- to 3-dentate; tube rugose and puberulous without, 05 in. long. Corolla-tube cylindric, 1 in. long, puberulous; limb 2-lipped; upper lip subequally 3-lobed, the middle lobe slightly the longest and incurved; lower lip rounded obtuse, rather shorter, scarcely 05 in. long; upper half of tube within thickly white-villous. Stamens slightly exsert; anther-cells slightly divaricate. Drupe obovoid, depressed at top, rugose and obscurely ribbed, 15 in. long; endocarp ribbed, bony, 4-celled. Seeds ovoid, acute; testa pale, slightly corky; cotyledons flat, shallowly emarginate at top.

Kedah: Langkawi Island, Curtis 2955. Penang: Kunstler (King's Collector) 1670; J. Scott. Province Wellesley: at Batu Kawan, Ridley 9353. Malacca: Griffith (K.D.) 6030; Maingay (K.D.) 1201. Singapore: Ridley 8900.—Distrib. Amherst in Tenasserim, Falconer; tidal forests of Tavoy, W. A. Hearsey.

5. PREMNA FŒTIDA, Reinw. ex Blume Bijdr. 816 (1825). A large shrub or small tree with spreading branches, reaching 20 to 30 ft. in height; bark white; branchlets subtetragonous to cylindric, tawnypubescent, as are the young leaves, the nerves of the mature leaves, and the inflorescence; nodes with a prominent villous ridge joining the bases of the petioles. Leaves chartaceous; ovate, sometimes ovatelanceolate, rarely ovate-oblong, shortly acuminate at apex, rounded or truncate or slightly cordate at base; shining on the upper surface and dark when dry; paler, often almost grey on the lower surface; margins entire or slightly repand above: 3 to 6 in. long, 2 to 3.5 in. broad; midrib slender, prominent beneath; main nerves 6 to 8 pairs, the lowest 2 pairs almost from the base, the lowest spreading, the rest at about 45° with the midrib, gently curving to and along the margin; transverse nervules rather distant, irregular; petiole 75 to 2 in. long. Corymbs lax, reaching 5 in. long and broad, subsessile or on about 1 in. long peduncles, 3-chotomous below, 2-chotomous above; the branches divaricate; bracts very small, linear; pedicels short, under 05 in. long; flowers white. Calyx cup-shaped, 05 to 075 in. long, 2-lipped, upper lip acutely 2-lobed, lower very shortly 3-lobed; tube puberulous without. Corollatube funnel-shaped, 'I in. long, densely white-villous in the upper half within; obscurely 2-lipped, upper lip short, lower 3-lobed, recurved. the midlobe longest and incurved. Stamens attached to the throat of the corolla-tube, shortly exsert; anther-cells elliptic with elliptic pores.

Ovary depressed, glabrous; style short; stigma very shortly bifid. Drupe globose, 4-sulcate; epicarp rugose; cells 4, all or fewer with seeds. Seeds fusiform, keeled; testa pale. Schauer in DC. Prodr. XI. 630; Miq. Fl. Ind. Bat. II. 891; Koord. & Val. Bijdr. VII. 192. P. opulifolia, Miq. l. c. 898. Gumira fætida, Hassk. in Florå, 25 beibl. p. 26. "Gumira domestica," Rumph. Herb. Amb. III. 208, fide Miq. & Schauer.

Kedah: near sea-level, Kunstler (King's Collector) 1737. Perak: on the coast at Matong, Wray 2493; near sea-level, Kunstler (King's Collector) 1016. Johore: at Batu Pahat, Ridley 11137. Singapore: cult., Ridley 6893.—Distrib. Java (Koorders 20179 β ; Zollinger 2740); Borneo (Haviland & Hose 3394, &c.).

We follow Koorders & Valeton in putting *P. opulifolia*, Miq., under *P. fatida*, Reinw. But our specimens agree better with the description of *P. opulifolia* than with those of *P. fatida*. As pointed out by Koorders & Valeton, the description of the calyx given for *P. fatida* as "obsolete sub-4-dentatus, vulgo 3-denticulatus, quarto dente abortivo" is abnormal. That given for *P. opulifolia* is quite correct.

6. Premna divaricata, Wall. Cat. 1781 (1828). A climbing shrub; branchlets slender, terete, nearly black when dry, with sparse rounded or oblong lenticels. Leaves membranous when young, chartaceous when older; ovate or elliptic, briefly acute or bluntly acuminate at apex, rounded or attenuate sometimes subcordate at base; upper surface slightly shining, glabrous except the nerves; lower dull, glabrous except for villous hairs along the midrib and in the axils of the main nerves, obscurely dotted; entire; 3 to 5 in. long, 2 to 3.5 in. broad; midrib slender, slightly impressed above; main nerves 5 to 6 pairs, at an angle of 40° to 60° with the midrib, the lowest 1 to 2 pairs from near the base, curved upwards to join in loops near the margin; transverse nervules few, irregular, inconspicuous, as are the finely netted reticulations; petiole 5 to 1.5 in. long, channelled above. Corymbs divaricate, many-flowered, slightly puberulous, terminal, reaching in fruit 5 in. in diam., sessile or on peduncles 1 to 2 in. long, 3-chotomous below, 2-chotomous above; bracts linear-lanceolate, small, the lowest sometimes leafy; pedicels very short; flowers greenish-white. Calyx cupshaped, prominently 2-lipped, the upper lip much longer than the lower, with 2 rounded 03 in. long lobes; the lower entire or shortly 3-toothed; tube rugose without and glandular-dotted. cylindric, 075 in. long, puberulous without, white-villous within on the upper half; limb 2-lipped; upper lip short, retuse, broad; lower lip 3-lobed, the midlobe longest, up to 075 in. Stamens inserted near the mouth of the corolla-tube, slightly exsert; anther-cells divaricate.

Ovary rounded; style as long as stamens; stigma very shortly bifid. Drupe ovoid, '25 in. long; epicarp smooth; pericarp fleshy; endocarp ribbed; pyrenes 3- to 4-celled. Schauer in DC. Prodr. XI. 681; Clarke in Hook. f. Fl. Br. Ind. IV. 575. P. lucidula, Kurz For. Fl. II. 263, not of Miq.

Penang: beach at Tanjong Bunga, Curtis 215. DINDINGS: Pangkore Island, Ridley 7180. Malacca: Maingay (K.D.) 1198-9; at Sungei Hudang, Goodenough 1350. SINGAPORE: gardens in scrub, Ridley 10841.—DISTRIB. Java.

7. PREMNA TRICHOSTOMA, Mig. Fl. Ind. Bat. II. 892 (1856). large climbing shrub, reaching to a considerable height, the stem reaching 3 to 5 in. in diam.; branchlets thick, shining, glabrous, pale Leaves at first chartaceous, afterwards subcoriaceous, very variable: ovate- or obovate-elliptic, sometimes nearly orbicular, shortly acuminate at apex or sometimes attenuately acute, rounded or subcordate or cuneate at base: glabrous on both surfaces except on the nerves; margins entire or sometimes undulate at apex; 4 to 7 in. long, 2 to 5 in broad; midrib slender, raised beneath; main nerves 5 to 6 pairs, at from 30° to 45° with the midrib, the lowest pair from the base, the next rather close, the rest distant, all straight at first, then branched outwards and curved to join near the margin, raised on both surfaces when old: transverse nervules many; petiole .75 to 1 in. long, pube-Corumbs terminal, reaching 4 to 5 in in diam., puberulous. sessile or on 1 in. long peduncles; branches 3- afterwards 2-chotomous. thickening in fruit; bracts lanceolate, short; pedicels none; flowers cream-coloured. Calyx cup-shaped, obscurely tetragonous, puberulous without, 05 to 07 in. long, 2-lipped, the upper lip 2-lobed, the lower faintly 2-toothed or entire; all teeth less prominent in fruit. Corolla campanulate; tube 1 in. long, densely villous within in the upper half; limb subequally 4-lobed, the lobes rounded, lower one slightly smaller. all recurved. Stamens inserted at the mouth of the corolla-tube, long exsert; filaments slightly flattened; anther-cells small, rounded, didymous, opening by elongated pores. Stigma 2-fid, the divisions divaricate. rather long. Drupe pyriform, 4-celled, one cell only enlarged and seedbearing. Seeds oblong, flattened; testa membranous. Koord. & Val. Bijdr. VII. 184. P. parasitica, Clarke in Hook. f. Fl. Br. Ind. IV. 574. not of Blume.

KEDAH: Langkawi Island, Curtis 2796. PERAK: at waterfall, 300 ft., Wray 2403; King's Collector 3008, 10310; Scortechini 192. MALACCA: Griffith 6019. JOHORE: Ridley 11136. SINGAPORE: Ridley 5026, 6828, 8914.—DISTRIB. Borneo (Haviland).

8. Premna perakensis, King & Gamble in Kew Bull. 107 (1908).

A shrubby climber; branches brown, sparsely lenticellate, glabrous, Leaves chartaceo-coriaceous; elliptic-oblong or -lanceolate, sometimes -obovate, shortly and bluntly acute at apex, narrowed or cuneate at base; both surfaces glabrous, even the nerves, slightly rugose; margins entire, slightly recurved; 3 to 5 in. long, 1.5 to 2.25 in. broad; midrib stout, impressed above, raised beneath; main nerves 5 to 6 pairs, also impressed above and raised beneath, the lowest pair opposite and from close to the base, starting at from 25° to 40° with the midrib and nearly straight, curving only near the margin where they form a looped intramarginal nerve; transverse nervules many, inconspicuous; petiole 5 to 75 in. long, glabrous, channelled above. Corymbs spreading, tawny-puberulous, reaching 6 in. in length and in diam., 3-chotomous, afterwards 2-chotomous, sessile or on stout peduncles 2 to 3 in. long; bracts ovate-lanceolate, those of lower divisions leafy; pedicels 0; flowers pale green with white stamens. Calyx obscurely quadrangular, pubescent, nerved, the nerves prominent in fruiting examples, 06 in. long; 2-lipped, the upper lip 2-lobed, the lower entire or obscurely 2-lobed. Corolla funnel-shaped; the tube 125 in. long, densely white-villous in the upper half; limb subequally 4-lobed, the lobes recurved, ciliate. Stamens inserted at the mouth of the corollatube, long exsert; filaments somewhat flattened; anther-cells nearly globose, didymous, opening by circular pores; connective glandular. Ovary glabrous; style long exsert; stigma divaricately 2-fid. Drupe smooth, pyriform, one cell only fertile. Seed ovate-oblong, flattened; testa membranous.

Perak: in rocky places in forest, at 800 to 1000 ft., King's Collector 7247, 10738; Scortechini 516.

This species comes very near to *P. trichostoma*, but has several important points of difference, such as the narrower, thicker leaves with glabrous nerves, the darker branches, the markedly nervose fruiting calyx, the large bracts, and the round openings of the anther-cells, so that we have preferred to describe it as a species instead of as a variety. In the corolla it nearly agrees, as also it does in the absence of pedicels and the one-seeded, pyriform drupe.

9. Premna punctulata, Clarke in Hook. f. Fl. Br. Ind. IV. 575 (1885). A shrub or small tree; branchlets dark brown, terete, lenticellate. Leaves chartaceous; broadly elliptic, suddenly shortly acuminate at apex, rounded at base; upper surface glabrous, shining, lower surface paler, reddish, puncticulate, pubescent on the nerves; margins entire; 4 to 6 in. long, 2 to 3 in. broad; midrib prominent; main nerves 4 to 5 pairs, the lowest pair very small, close to the base, the next pair a little above, the rest more distant, all curving upwards to

anastomose near the margin; transverse nervules very prominent, as is the netted reticulation; petiole 1 in. long, slender, channelled above. Corymbs many-flowered, terminal, paniculate, pubescent, 4 to 5 in. in diam.; lower bracts 5 in. long, linear-oblong; pedicels very short or none. Calyx ·06 in. long, minutely grey-pubescent and glandular, 2-lipped, upper lip 2-toothed, lower lip also 2-toothed or subentire. Corolla tubular, ·1 in. long, villous at the throat within, glabrous below; lobes short, rounded. Stamens included; filaments inserted in the middle of the tube, short; anthers reniform; cells slightly divergent. Ovary glabrous; style rather short; stigmatic lobes slender, recurved. Drupe not known.

MALACCA: Maingay (K.D.) 1200.

10. PREMNA CORDIFOLIA, Roxb. Fl. Ind. III. 78 (1832). reaching 8 to 12 ft. in height, with dark brown bark on the old wood; branchlets light brown, darker when dry, the size of a crow-quill, glabrous, terete. Leaves membranous; ovate or ovate-cordate, acuminate at apex, rounded or cordate at base; upper surface shining, bullate, drying brown, glabrous except on the midrib and main nerves; lower surface also nearly glabrous, yellowish-brown when dry; margins entire, slightly recurved; 3 to 7 in. long, 2 to 3 in. broad; midrib slender, but strongly raised beneath; main nerves 5 to 6 pairs, at about 50° with the midrib, at first nearly straight and then curving to join in a looped intramarginal nerve, each pair on the same side joined by few (4 to 5) irregular transverse nervules and lesser reticulations; petiole slender, 5 to 1 in. long; upper side tawny-puberulous. Corymbs manyflowered, dense, terminal, tawny-puberulous, about 3 in. long, and the same or rather more in diam.; peduncles 1 to 3 in. long, with tawnypuberulous leaf-like bracts; bracts of corymb small, lanceolate, acute; branches at first decussate, then dichotomous; pedicels very short, rather thick; flowers greyish-white. Calyx ·1 in. long, 2-lipped; upper lip 2-lobed, lower entire; lips short, broad, rounded. Corolla-tube ·2 in. long, funnel-shaped, densely villous within; limb 2-lipped; anthercells shortly divergent. Ovary glabrous; style as long as corolla-tube. Drupe obovoid, slightly depressed at top; exocarp thin, shining, black; mesocarp fleshy; endocarp hard, pitted, 3- to 4-celled, one cell usually only fertile. Seed ovoid acute; cotyledons flat, orbicular, 125 in. in diam. Walp. Rep. IV. 94; Schauer in DC. Prodr. XI. 632, partly, not of Wight or Bedd.; Miq. Fl. Ind. Bat. II. 895, in part only; Clarke in Hook, f. Fl. Br. Ind. IV. 572.

Penang: at Tanjong Bunga, Curtis 861; Kunstler (King's Collector) 1480. Province Wellesley: at Krian, Ridley 9386. Singapore: Lobb.

11. PREMNA WRAYI, King & Gamble in Kew Bull. 108 (1908). A climbing nearly quite glabrous shrub; branches stout, obscurely quadrangular, dark brown; branchlets similar, darker, smooth. coriaceous; elliptic or elliptic-lanceolate, gradually acuminate at apex. attenuate at base, often unequally; shining and glabrous on both surfaces except for small tufts of hair in the axils of the main nerves beneath, olive-brown when dry; entire; 4 to 8 in. long, 2 to 4 in. broad; midrib stout, impressed above, prominently raised beneath; main nerves 6 to 8 pairs, impressed above, raised beneath, the lowest pair very faint from the base and close to the margin, the next stout and shortly above, the rest distant at about 50° with the midrib, curving upwards to and along the margin, the upper ones joined in a looped intramarginal nerve; transverse nervules straight and fairly regular; reticulations rather prominent on the upper surface when dry; petiole ·5 to 2 in. long, channelled above. Corymbs dense and compact, about 4 to 5 in. broad at top, glabrate or very minutely puberulous on upper branches and calyx; lower branches 3-chotomous, upper 2-chotomous, much ramified and curving inwards; peduncle about 1 in. long, stout; main branches 1 to 1.5 in. long; bracts very small, linear, the lower ones leafy; pedicels about 05 in. long to the joint below the calyxtube. Calyx deeply 2-lipped; the upper lip sharply 2-lobed, the lower 3-toothed; the lobes spreading in the fruiting stage; tube rugose. Corolla not seen. Drupe obovoid, 25 in. long and broad; epicarp rugose, glandular-dotted; pyrenes 4. Seeds plano-convex, ovate, ·175 in. long; testa white-corky; cotyledons oblong, retuse at tip, flat, fleshy, ·15 in. long; radicle ·025 in.

PERAK: at Tapa, Wray 200.

At first sight this species resembles P. Kunstleri in its coriaceous shining leaves and stout branches, but differs in the more compact corymbs and the deeply lobed calyx.

12. Premna sterculifolia, King & Gamble in Kew Bull. 108 (1908). A stout, tree-like, climbing shrub; branches reddish-brown, smooth; branchlets terete, purple, sparsely scabridly puberulous Leaves membranous; ovate, acuminate at apex, truncate or somewhat cordate at base; both surfaces reddish-brown when dry; upper sparsely setulose and pubescent on the nerves, lower slightly puberulous, sparsely glandular-dotted; 4 to 9 in. long, 3 to 5 in. broad; midrib prominent, channelled above, raised beneath; main nerves 6 pairs, raised beneath, the 2 lowest pairs from close to the base spreading, the rest at about 40° with the midrib, curved upwards to and along the margin, joined by prominent transverse nervules; petiole 2 to 4 in. long, channelled above. Cymes in large spreading, slightly puberulous

many-flowered paniculate corymbs reaching 9 in. long and 8 in. broad; peduncles stout, 3 to 4 in. long; branches 3-chotomous at first, afterwards 2-chotomous; ultimate cymules crowded; bracts linear, very small, caducous; pedicels short, slender; flowers pale green. Calyx campanulate, obscurely 2-lipped; the upper lip nearly entire, the lower entire or obscurely toothed; tube '05 in. long, glandular and puberulous, scaly without. Corolla-tube funnel-shaped, puberulous, '125 in. long, densely white-villous within except at the base; 2-lipped, upper of 1 short recurved lobe, lower of 3 recurved obtuse lobes, the midlobe the longest, '075 in. long. Stamens exsert; the filaments twisted; anthers ellipsoid, divaricate. Ovary glabrous, depressed; style slender, nearly '25 in. long; stigma bifid with slender spreading lobes. Drupe globose, depressed, much tuberculate and red when dry; pyrene woody, tuberculate, roughly 4-angled. Seeds usually 1 only perfect, obovate, '1 in. long; testa membranous; cotyledons conform to the seed, fleshy; radicle pointed.

Perak: at waterfall, Wray 1828; Scortechini; King's Collector 3067, 7531, 8373.

VAR. cordata, King & Gamble, l.c. Leaves more deeply cordate at base; branches of inflorescence more distant than in type; calyx with upper lip 2-lobed, the lower entire or obscurely toothed.

PERAK: Scortechini 273.

13. PREMNA RIDLEYI, King & Gamble in Kew Bull. 109 (1908). A climbing shrub; branches stout, with grey shining bark; branchlets slender, terete, brown. Leaves chartaceous, opposite or sometimes one of each pair rather higher than the other; ovate, ovate-oblong or slightly obovate, rounded or very shortly acute at apex, rounded or attenuate often unequally at base; both surfaces glabrous and dull; margins entire; 1.5 to 3 in. long, .75 to 1.5 in. broad; midrib slender; main nerves 6 to 7 pairs, the lowest 1 or 2 pairs from the base, at an angle of 30° to 40° with the midrib, straight at first, then gently curved to and along the margin; transverse nervules and reticulations faint; petiole slender, 25 to 5 in. long. Corymbs terminal, 1.5 to 5 in. long, and 2 to 5 in. broad, many-flowered, tawny-puberulous; peduncles ·75 to 2 in. long; branches at first 3- afterwards 2-chotomous; bracts linear-lanceolate, small; pedicels none or minute; flowers greenishwhite. Calyx campanulate, subquadrangular, 2-lipped, each lip 2-lobed. with minute teeth; tube 05 in. long, puberulous. Corolla-tube somewhat tubular, slender, '1 in. long, puberulous in the lower half within. long white-villous in the upper; lobes 4, equal, oblong, rounded at tip. ·05 to ·075 in. long, incurved at length. Stamens inserted, 2 upper at the top of the throat of the corolla-tube, 2 lower lower down; filaments slightly flattened, long exsert; anthers small; cells rounded, slightly

divaricate; connective glandular on the back. Ovary rounded, glabrous; style as long as stamens, ·2 in.; stigma bifid; the lobes ·025 in. long, usually recurved. Drupe not seen.

Perak: Scortechini 455. Singapore: garden jungle, Ridley 6826.

14. Premna Kunstleri, King & Gamble in Kew Bull. 109 (1908). A large shrub or small tree, nearly quite glabrous, sometimes climbing: branches stout, thick, purplish-brown; branchlets the size of a quill, terete, glabrous, sparsely lenticellate. Leaves coriaceous, elliptic, sometimes elliptic-oblong or obovate, obtuse at tip with a short blunt abrupt acumination, rounded or subcordate at base; both surfaces glabrous, more or less shining when dry; margins entire, slightly recurved: 4 to 7 in. long, 2.5 to 4 in. broad; midrib very stout, impressed above. raised prominently beneath; main nerves 5 to 7 pairs at from 50° to 60° with the midrib, the lowest pair small, from the base, the second from close above it, the rest more distant, all curved upwards to join in a looped intramarginal nerve and joined by four irregular transverse veinlets; reticulations minutely netted, forming a prominent network on the upper surface when dry; petiole .75 to 1.25 in. long, smooth but channelled above. Corymbs terminal, spreading, long-branched, 3-chotomous below, 2-chotomous above, glabrous except for very minute spare tawny pubescence on the upper branches and calvx-tube, sessile or pedunculate, the peduncle or primary branches 3 to 4 in. long, the whole corymb reaching 7 in. in length and 5 in. in breadth; bracts linear or linearlanceolate, the lower ones leafy; pedicels very short, less than .05 in. to the joint under the calvx-tube; flowers pale greenish-white. Calyx cupshaped, 075 in. long, truncate or very obscurely 2-lipped, in fruit very shallow and almost quite entire. Corolla-tube tubular, 125 in. long, the lower half glabrous and almost hyaline, the upper shortly whitevillous: limb 2-lipped, lower lip 3-lobed, the midlobe longest, the two others and the upper lip equal, all erect or incurved. Stamens shortly exsert, attached just below the mouth of the corolla-tube; anthercells rounded, slightly divaricate, pores elliptic. Ovary glabrous. depressed, 4-celled; style as long as stamens; stigma very shortly bifid. Drupe obovoid, faintly ribbed, 25 in. long; epicarp smooth, waxywhite (Kunstler); pyrenes 4-celled, one or more cells fertile. Seeds obovate, plano-convex, 15 to 2 in. long; testa white, corky; cotyledons flat, fleshy, 15 in. long, 1 in. broad, retuse at tip; radicle minute.

Perak: on low ground, under 500 ft. in alt. King's Collector 938, 4723, 5949. Malacca: at Sungli Udang, Goodenough 1350.

To this species we also refer Forbes' No. 1424 from the Lampongs, Sumatra, but the leaves reach over 8 in. in length and 5 in. in breadth with slightly attenuate bases, and the fruiting calyx is rather more 2-lipped.

15. Premna pyramidata, Wall. Cat. 1779 (1827). A small or medium-sized tree (a large tree-Wallich), reaching 40 to 50 ft. in height, and up to 5 ft. in girth; bark light greyish-brown; branches stout, pale brown; branchlets obscurely quadrangular, stellately tomentose with tawny tomentum. Leaves chartaceous; ovate, acuminate at apex, cordate or rounded sometimes attenuate at base; both surfaces brown when dry, the upper dark glabrous except on the nerves, the lower pale glabrescent; margins entire; 6 to 14 in. long, 3 to 8 in. broad; midrib stout, stellate-tomentose on both surfaces; main nerves 7 to 10 pairs, the lowest two pairs from near the base, the rest distant at an angle of about 60° with the midrib, curving gently upwards and joined by many regular transverse nervules very prominent on the under surface; petiole 1 to 4 in. long, channelled above, stellately scurfypubescent. Cymes in large terminal stellately-pubescent pyramidal panicles or corymbs, reaching 12 in. in length, and 6 to 9 in. in breadth; common peduncle 1 to 3 in. long; branches at first 3- afterwards 2-chotomous, usually ascending; bracts many, linear, reaching 5 in. long; flowers crowded at the ends of the branches on very short pedicels, greenish-white. Calyx campanulate, glabrous within, stellatelypubescent without; tube 075 in. long; teeth 5, subequal, about 025 in. long, the posterior three thickened, the two anterior shorter and more slender. Corolla bilabiate, 15 to 2 in. long; upper lip broad; lower lip 3-lobed, the midlobe the longest and spreading, the side lobes shorter and more obtuse, usually incurved; tube with a ring of retrorse stiff hairs at the throat, otherwise glabrous. Stamens 4, included; anther-cells elliptic, slightly divaricate; filaments stout. glabrous, depressed; style thickened with very shortly bifid stigma. Drupe globose or obovoid, glabrous, depressed at top, 2 to 25 in. in diam.; pericarp fleshy; pyrene rugose, very hard, 4-celled. usually 1 only, oblong. Schauer in DC. Prodr. XI. 633; Miq. Fl. Ind. Bat. II. 897; Hook. f. Fl. Br. Ind. IV. 576. P. tomentosa, Kurz For. Fl. II. 260.

PERAK: Wray 3691; Scortechini; at Kwala Dipang, Ridley 9699; King's Collector 923, 2039, 2667, 6851, 10298. Selangor: Ridley 7596.—DISTRIB. Burma (Wallich 1779), Java (Teysmann 14), Timor (Forbes 3892), &c.

We have identified Teysmann's Java specimens as belonging to P. pyramidata, but we are not sure if Koorders & Valeton (Bijdr. VII. 179) considered them to belong to their P. tomentosa, which, judging by Koorders' own specimens 9714 β in the Calcutta Herbarium, is not P. pyramidata. We have, therefore, not quoted Koorders & Valeton. We agree with Sir D. Brandis ('Indian Trees,' 511) in thinking that P. bengalensis, Clarke, is probably only a narrow-leaved form of P. pyramidata.

A specimen bearing Father Scortechini's ticket, but without number and without any note of locality, appears to be *Premna acuminata*, R. Br. Prod. Nov.-Holl. 512; Benth. & Muell. Fl. Aust. V. 60, a North Australian species with long-petioled, cordate-ovate, deltoid, poplar-like leaves, and very loose panicles. It may very likely have been collected in a Botanic Garden.

A specimen collected by R. Derry at Bukit Borwang, Malacca, is too incomplete for identification. It may belong to *P. leucostoma*, Miq. Fl Ind. Bat. II, 899.

8. GMELINA, Linn.

Trees or shrubs, unarmed or armed with axillary divaricate spines (abortive branchlets). Leaves opposite, entire or more or less lobed. Flowers large, yellow or brownish-yellow, often tomentose, in dense or lax sessile or pedunculate cymes along the branches of a terminal panicle; bracts usually small, sometimes large, leafy and coloured. Calyx campanulate, 4- to 5-toothed or subentire, persistent and unaltered in fruit. Corolla obliquely campanulate or funnel-shaped; tube slender below, much dilated above; limb spreading, oblique, 4- to 5-lobed. Stamens 4 didynamous, inserted below the throat of the corolla, included; anthers pendulous, with oblong sub-separate cells. Ovary 4-celled, the cells 1-ovuled; style slender; stigma shortly 2-fid; ovules laterally attached to the septum at their middle or higher. Fruit a succulent drupe; endocarp bony, 2- to 4-celled, usually with a conical hollow in the middle open on one side. Seeds oblong; testa thin, with a corky layer outside; albumen none; cotyledons fleshy; radicle inferior. —Distrib. Species about 11, in India, Malaya, China and Australia.

- G. Hystrix, Schultes ex Kurz in Journ. As. Soc. XXXIX. ii. 81 (1870), and For. Fl. II. 265, is a large spinous scandent shrub with very large coloured bracts, a native of Siam and the Philippines, also, according to Kurz, Tenasserim. It is probably only a garden escape in Singapore (Garden road, Ridley 3944).
- 1. GMELINA ASIATICA, Linn. Sp. Pl. 626 (1753). A much-branched spinous straggling shrub; bark yellowish-white; branchlets horizontal, rigid, puberulous, the smaller ones often becoming spines at their ends. Leaves membranous; ovate or elliptic or obovate, often 3- or more lobed, the midlobe the longest; upper surface glabrous, lower surface glaucescent from a coating of minute round glands, and villous on the nerves; margins entire except for the 3 or sometimes more lobes which point upwards; '75 to 1.5 in. long, '5 to 1 in. broad; midrib slender; main nerves 2 to 3 pairs; reticulations few; petiole very

slender, up to 5 in. long. Racemes fulvous-tomentose, terminal, 1 to 2 in. long; cymules very short; bracts small, caducous; pedicels very short flowers bright yellow. Calyx 15 to 2 in. long; tube with large flattened glands, otherwise pubescent; teeth 4, very small, triangular, acute. Corolla 2-lipped, obliquely funnel-shaped, puberulous without, nearly 2 in, in length; tube slender below, gradually inflated above; lobes 4, ovate, more or less rounded, the lowest the longest. Stamens curved, slightly exsert; filaments thickened, pubescent; anther-cells opening in a horseshoe, connective flattened, all 4 similar. depressed, glabrous; style slender, exsert; stigma 2-lobed. Drupeobovoid, vellow when ripe, 75 in. long; pyrene pyriform with a basal cavity, bony. Seeds usually 1 or 2 only, oblong at base; testa membranous with a corky covering; albumen fleshy. Roxb. Fl. Ind. III. 87; Lamk. Ill. t. 542; Wall. Cat. 1818 (in part); Schauer in DC. Prodr. XI. 679; Wight Ill. t. 174; Bedd. Fl. Sylv. CXXXII; Brandis For. Fl. 365; Blume Bijdr. 814; Mig. Fl. Ind. Bat. II. 866; Clarke in Hook. f. Fl. Br. Ind. IV. 582; Trimen Fl. Ceyl. III. 355; Cooke Bomb. Fl. II. 425; Prain Beng. Plants 829. G. coromandeliana, Burm. Fl. Ind. 132. G. lobata, Gaertn. Fruct. I. 268, t. 56, excl. syn. Rumph. parvifolia, Roxb. Cor. Pl. II. 32, t. 162; Wall. Cat. 2654; Schauer, l. c. G. parviflora, Roxb. Fl. Ind III. 87. G. inermis, Blanco Fl. Filip. 493. Michelia spinosa, Amman. in Act. Petrop. VIII. 218, t. 18.

Perak: Scortechini. Singapore: T. Anderson 135; Kurz; Kunstler 102.—Distrib. India (Deccan Peninsula), Ceylon, Java, Borneo, &c.

2. GMELINA VILLOSA, Roxb. Hort. Beng. 46 (1814), and Fl. Ind. III. 86 (1832). A large straggling shrub or small tree with olive-coloured bark; branches spreading and drooping; branchlets round, villous; spines straight, axillary, 25 to 5 in. long. Leaves membranous when dry; ovate trapeziform, acute at apex, cuneate at base; upper surface pubescent when young, glabrous and dark-coloured when old; lower surface fulvous-tomentose; margins entire or sometimes obscurely lobed; 1 to 4 in. long, 1 to 2.5 in. broad; midrib slender, raised beneath; main nerves pubescent above, 3 to 4 pairs, the lowest pair from just above the base; transverse nervules slender, nearly horizontal; petiole slender, .75 to 1.5 in. long, channelled above. Racemes fulvous-tomentose, 1 to 2 in. long; cymules very short; bracts ovate-lanceolate. cuspidate, about 5 in. long, more or less leafy, deciduous when the flowers open; pedicels very short; flowers yellow. Calyx 15 in. long: tube with 3 or more large glands on the under side; teeth 4, small, triangular, acute. Corolla-tube slender below for nearly 5 in., then obliquely expanded for nearly 1 in., including the 4 lobes, the lowest of which is longest. Anthers, especially of longer pair of stamens, with the connective enlarged behind. Style slender, as long as the longer pair of stamens; stigma 2-lobed, lobes unequal. Drupe globose, yellow when ripe, fleshy, '75 in. in diam.; pyrene pyriform, '5 in. long, with a cavity opening on one side at the base; endocarp very hard, thick. Seeds usually 1 to 2 only fertile, compressed, acute at the ends; cotyledons fleshy, obcordate, '25 in. long; radicle very small. Jack in Mal. Misc. I. 17, and in Hook. Bot. Misc. I. 284; Wall. Cat. 1816; Schauer in DC. Prodr. XI. 679; Miq. Fl. Ind. Bat. II. 867; Clarke in Hook. f. Fl. Br. Ind. IV. 582; Koord. & Val. Bijdr. VII. 198. G. asiatica, Wall. Cat. 1818 (in part); Kurz For. Fl. II. 265 (not of Linn.). Gmelina, sp. n. 2, Griff. Notul. IV. 179. "Radix deipara," Rumph. Herb. Amb. II. 124, t. 39.

Kedah: Langkawi Island, Curtis. Penang: Wallich 1816; Phillips; G. King; Curtis 454. Perak: Wray 734; Scortechini 740. Malacca: Griffith 6057; Maingay (K.D.) 1189. Singapore: G. Thomson; Kurz; T. Anderson; Deschamps; Kunstler 103.—Distrib. Burma (Kurz), Nicobars (Kurz), Siam, Java, Sumatra (Forbes 1576, 2642).

9. CLERODENDRON, Linn.

Trees or shrubs, sometimes straggling or climbing. Leaves opposite or rarely verticillate, simple, entire or dentate or angularly-lobed. Flowers small or large, of various colours, in axillary cymes or terminal panicles, often leafy below; bracts conspicuous or small; bracteoles 0 or very small. Calyx campanulate, rarely tubular, truncate, 5-toothed or almost 5-partite, persistent, often accrescent, often coloured in fruit. Corolla hypocrateriform or infundibular; tube usually long, slender; limb usually oblique, more or less 2-lipped, 5-lobed, the lobes spreading. Stamens 4 didynamous, long-exserted; filaments filiform, involute in the bud; anthers ovate or oblong, more or less uniform; cells parallel, adherent above, separate below; filaments attached at the notch. Ovary imperfectly 4-celled, the cells 1-ovuled; style filiform; stigma shortly bifid. Fruit a globose, succulent or rarely dry drupe, 4-grooved or 4-lobed, separating into 4 pyrenes, of which 1 to 3 are sometimes suppressed; exocarp usually fleshy; endocarp bony or crustaceous. Seeds oblong or pyriform; albumen 0; cotyledons thick, fleshy; radicle very small, inferior.—DISTRIB. 100 to 120 species, in the warm regions of both hemispheres, but chiefly in the eastern.

Corolla hypocrateriform, the tube rarely more than 1 in. in length (Subgenus 1. Euclerodendron):—

Cymes axillary :-

Cymes few-flowered from most axils; leaves small; calyx-

teeth very short 1. C. neriifolium.

Cymes in deflexed, pedunculate, close panicles, from upper axils; leaves large; calyx-lobes linear-lanceolate,	
over ·2 in. long	2. C. deflexum.
Cymes in leafy panicles, the lower branches appearing	
axillary:—	
Leaves and inflorescence glabrous or only slightly pube-	
rulous; leaves usually over 1 in. broad, long-acuminate,	
membranous	3. C. disparifolium.
Leaves and inflorescence scabrous-hispid, more or less	S. C. atopar ijotoani.
pubescent; leaves under 1 in. broad, acute, charta-	
ceous	4. C. lankawiense.
Cymes in terminal panicles :—	4. O. tannatotense.
Leaves oblong or lanceolate:—	
Panicles more or less pendulous, long-pedunculate:	
Leaves 1 to 3 in. broad; calyx-lobes lanceolate,	F G
acute	5. C. penduliflorum.
Leaves 2 to 6 in. broad; calyx-lobes ovate, cuspidate	6. C. umbratile.
Panicles erect, short-pedunculate or sessile:—	
Leaves entire; calyx cleft nearly to the base; stems	
fistular:—	
Leaves glabrous; main nerves distant; calyx-lobes	
acuminate with incurved tips	7. C. myrmecophilum.
Leaves puberulous; main nerves rather close;	
calyx-lobes acute, glandular	8. C. Curtisii.
Leaves serrate, rarely entire; calyx truncate; teeth	
minute	9. C. serratum
Leaves ovate, usually cordate at base:-	var. Wallichii.
Panicles pyramidal, thyrsoid; leaves hairy:—	
Corolla-tube over ·5 in. long; leaf-margins den-	
	10. C. infortunatum.
Corolla-tube under '3 in. long; leaf-margins	•
	11. C. villosum.
Panicles corymbose; leaves glabrous; corolla-tube	
	12. C. Colebrookianum.
Leaves usually 3 to 7-lobed, under surface promi-	
	13. C. paniculatum.
Corolla infundibuliform, the tube more than 1 in. in length	10. C. panicavarani.
(Subgenus 2. Siphonanthus):—	
Leaves usually verticillate, lanceolate; panicle very long,	
그 그러지 않는 그 그리고 있는 것이 되었다. 그 그리고 있는 그리고 있는 그리고 있는 것이 없었다.	14 0 0:1
many-flowered; drupe blue Leaves opposite, elliptic or ovate; panicle short, few-	14. C. Siphonanthus.
그 사이 그는 이렇게 하면서 이미를 가는 것을 보고 있다. 그 사이를 보고 있는 것은 사람들이 되었다.	15 0 D:n:
nowered; drupe red	15. C. Ridleyi.
The following species are found in cultivation	or as escapes from

The following species are found in cultivation or as escapes from cultivation:—

CLERODENDRON FRAGRANS, R. Br. in Ait. Hort. Kew. ed. 2, IV. 63 (1812). A double-flowered shrub, with large leaves of unpleasant odour, the flowers white merging into dark purple and fragrant.—Singapore: Deschamps; King's Collector 304.

- C. CALAMITOSUM, Linn. Mant. 90 (1767). A slender white-flowered shrub, native of Java and often found in gardens. In the Fl. Br. Ind. it has been described as a Malacca species on the authority of Maingay's specimen, but Mr. Ridley informs us that in his opinion the plant is not indigenous and that Maingay's specimen came, in all probability, from a garden escape.
- C. Thomsonæ, Balf. f. in. Trans. Bot. Soc. Edinb. VII. 265, t. 7, and 580, t. 16 (1863). A climbing shrub, native of Tropical Africa, with opposite ovate leaves and terminal lax cymes of flowers with a white calyx and crimson corolla.—Penang: Curtis 124. Singapore: Deschamps.
- C. SQUAMATUM, Vahl Symb. II. 74 (1791). An erect shrub, native of India, China, and Sumatra, with ovate cordate leaves and scarlet flowers in large panieles.—Singapore: *Ridley* 9209.
- 1. CLERODENDRON NERIIFOLIUM, Wall. Cat. 1789 (1828). A straggling shrub; branches ashy-grey, lenticellate; branchlets slender, greyish-brown. Leaves membranous, ternate or opposite; elliptic, acute or rounded often slightly emarginate at apex, shortly attenuate at base; glabrous, or, when young, sparsely pubescent on both surfaces; margins entire; 1.5 to 3.5 in. long, .75 to 1.75 in. broad; midrib slender; main nerves about 5 pairs, straight or branched to meet in an obscure looped intramarginal nerve; reticulations finely netted; petiole slender, 25 to 5 in. long. Cymes axillary, umbellate, sometimes in a 7-flowered dichasium, often only 3-flowered; peduncle 1 to 1.5 in. long; bracts linear, setaceous; bracteoles similar but smaller; pedicels 15 to 25 in. long; flowers white, purplish-pink (Forbes). Calyx tubular-campanulate, enlarged in fruit and then cup-shaped; tube 15 in. long, pubescent and gland-dotted without; teeth 5, minute. Corolla-tube very slender, 75 to 1 in. long; gland-dotted without, villous within; lobes 5, spreading, unequal, somewhat oblong, about 25 in. long. Stamens red, long-exserted; anther-cells oblong, parallel. Ovary cylindric, obtuse; style very slender; stigma shortly bifid. Drupe obovoid, 5 in. long, 4 in. in diameter; top depressed; exocarp spongy; pyrenes 4 readily separating, endocarp crustaceous. Seed obovoid; testa thin; cotyledons oblong, thick, fleshy; radicle very short, thick. Schauer in DC. Prodr. XI. 660; Mig. Fl. Ind. Bat. II. 839; Clarke in Hook. f. Fl. Br. Ind. IV. 589; Prain Beng. Plants 835. C. inerme, Benth. Fl. Hongk. 271, and Fl. Austral. V. 61; Schauer l. c. (in part); Wall. Cat. 1788, Sheet 1 or A. C. inerme var. neriifolia, Kurz For. Fl. II. 266. Volkameria neriifolia, Roxb. Fl. Ind. III. 64. "Jasminum litoreum," Rumph. Herb. Amb. V. t. 46.

Kedah: in Langkawi Island, Curtis (Hamad). Penang: at Batu Ferengy, Curtis 2782; (or Singapore), Wallich 1788, 1. Perak: at

Krian, Scortechini 1382. Malacca: Griffith (K.D.) 6056,1; on swampy ground near the sea, Maingay (K.D.) 1188. Johore: G. King. Singapore: Kunstler 59; Hullett 143; seashore, Deschamps.—Distrib. India (Chittagong at Mascal Island), Burma (Arracan and Tenasserim coasts), Sumatra (Forbes 1802), Borneo (Haviland 1018, 3555), Siam, Philippine Islands, China, Australia, Polynesia.

A coast plant, similar to *C. inerme*, Gaertn., of the coasts of India, and considered by some to be a variety of it. It is distinguished by the leaves of different shape and texture, the smaller and more slender and glandular corolla, and the larger drupe. The leaves are sometimes lanceolate (see Roxb. Ic. No. 2524).

2. CLERODENDRON DEFLEXUM, Wall. Pl. As. Rar. III. 10, t. 215 (1832), and Cat. 1808. A shrub, reaching in height 4 ft. (Wallich), 4 to 6 ft. (Kunstler); branches obscurely quadrangular, furrowed, pubescent, pale-brown. Leaves opposite, membranous when dry; variable in shape, elliptic oblong-obovate or oblanceolate, cuspidate-acuminate at apex, rounded or cuneate at base; upper surface slightly pubescent when young, afterwards glabrous except on the nerves; lower surface softly pubescent, at length glabrate; margins entire or slightly undulate repand; 6 to 16 in. long, 2 to 6 in. broad; midrib strong, prominent beneath, pubescent; main nerves 10 to 16 pairs, prominent beneath, the lowest pair from the base at an acute angle, the rest curving upwards to and along the margin; transverse nervules rather regular and conspicuous in old leaves; reticulations netted; petiole 1 to 2.5 in. long, pubescent, swollen above and below, channelled on the upper side. Panicles corymbose, axillary in the ultimate or penultimate axils of the branches, usually deflexed at right angles to the branch; peduncles 1 to 8 in. long, with 1 or 2 pairs of bracts like small leaves along them; bracts of the inflorescence lanceolate; corymbs crowded with single flowers or short trichotomous cymes, very manyflowered; bracteoles many, linear; peduncles, bracts, branches and calyx all red when fresh; buds clavate; flowers white tinged with pink. Calyx-tube very short, scarcely 1 in. long; lobes linear-lanceolate, erect, pubescent, 2 to 3 in. long; fruiting calyx enlarged and stellately spreading. Corolla-tube very slender, .5 to .75 in. long. glabrous; lobes subequal, spreading, spathulate, up to 25 in. long. Stamens long-exsert, filaments very slender, glabrous, anthers oblong: cells parallel. Ovary rounded, obtuse; style very slender; stigmatic branches short. Drupe purple, globose, depressed, smooth, with 4 or fewer pyrenes; pyrenes pyriform, 35 in. long, 25 in. broad; endocarp crustaceous, reticulate; seeds conform to the pyrenes; testa membranous; cotyledons unequal, fleshy; radicle very small. Schauer in DC. Prodr. XI. 665; Miq. Fl. Ind. Bat. II. 875; Clarke in Hook. f. Fl. Br. Ind. IV. 593.

Penang: Porter (Wallich 1808a); Curtis 81. Perak: at Gunong Ijuk, &c., Scortechini 433, 1230; at Tapa, Waterfall, Maxwell's Hill, &c., Wray 1359, 1414, 2661, 3231, 4203; at Goping, Bukit Bingarang, &c., King's Collector (Kunstler) 168, 307, 1875, 6818. Malacca: Cuming 2368; Griffith; Maingay (K.D.) 1185; Hullett 404; at St. John's Hill, Hervey; at Ayer Punas, Derry 296. Johore: G. King. Singapore: Wallich (cf. Pl. As. Rar.); Walker 257, 288; G. King.

3. Clerodendron disparifolium, Blume Bijdr. 809 (1826). A shrub or small tree, reaching sometimes 20 ft. or more in height; branches pale brown, lenticellate, obscurely quadrangular; branchlets similar, slender, puberulous. Leaves membranous, the pairs more usually equal but occasionally unequal in size; oblong- or elliptic-lanceolate, long-acuminate at apex, acuminate or acute occasionally almost rounded at base; glabrous and pale on both surfaces except sometimes on the midrib beneath; margins entire or undulate, or obscurely toothed; variable in size as in shape, 2 to 7 in. long, .75 to 2.5 in. broad; midrib slender; main nerves 5 to 7 pairs, the lowest from close above the base and at about 20° to 30° with the midrib, the rest distant, starting at 50° to 60° with the midrib and curving upwards to near the margin, the upper ones joining in an intramarginal looped nerve; reticulations distant, transverse, not prominent; petiole slender, variable, 5 to 2.5 in. long, often twisted at base. Cymes puberulous, in lax spreading terminal or axillary brachiate panicles; the branches slender, repeatedly trichotomous; terminal ones sometimes up to 6 in. long, axillary ones about 2 to 3 in. long; peduncles very slender; bracts linear, usually about 25 in. long, those of main branches sometimes leafy, caducous after flowering; pedicels filiform, 25 to 5 in. long; buds clavate; flowers pale yellow. Calyx reddish; tube campanulate, about 1 in. long; lobes as long as tube, triangular, acute, prominently nerved; the calvx enlarged in fruit to about 5 in. long, with dark red reflexed lobes. Corolla-tube slender, .5 to .75 in. long, glabrous without, puberulous within; lobes 5, subequal, spathulate, 2 to 25 in. long. Stamens exsert. Ovary glabrous; style as long as stamens; stigma shortly bifid. Drupe globose, succulent, 25 in. in diameter. Seeds usually 2 fertile, ovoid; testa thin, wrinkled; cotyledons thick, fleshy; radicle minute. Schauer in DC. Prodr. XI. 672; Hassk. Retzia i. 57; Miq. Fl. Ind. Bat. II. 871; Clarke in Hook, f. Fl. Br. Ind. IV. 589; Koord. & Val. Bijdr. VII. 212. C. acuminatum, Wall. Cat. 1792; Schauer l.c. 662; Miq. l. c. 869. C. Jackianum, Wall. Cat. 1794, and in Hook. Bot. Misc. I. 284. (note to C. nutans, Jack); Bot. Mag. t. 3049 (in note); Schauer l.c., 664; Miq. l.c. 872.

Kedah: at Pulau Songsong, Curtis. Penang: at Penara Bukit, Curtis 1539. Perak: Wray 1352, 2841; Curtis 2043, 3196, 3333; King's Collector 751, 879, 2301, 4130, 4331, 4332, 5197?, 8772; Scortechini 297, 314, 922. Dindings: Pangkore, Scortechini 1011; Curtis 1638. Selangor: Curtis 3778. Malacca: Griffith; Harvey; Cuming 2378, 2395; Ridley 378; Derry 414; Holmberg 810; Goodenough 1773. Johore: Cantley 19. Singapore: Wallich 1792 c; Lobb; Ridley; G. King; Maingay (K.D.) 1186; Deschamps; Murton 93; Walker 54; Kunstler 1, 119.—Distrib. Malay Archipelago.

4. CLERODENDRON LANKAWIENSE, King & Gamble in Kew Bull. 110 (1908). A shrub; branchlets scabrid-puberulous, obtusely quadrangular, channelled. Leaves chartaceous, opposite; oblong-lanceolate or oblanceolate, acute at apex, attenuate at base; both surfaces sparsely glabroushispid, pubescent on the nerves beneath; margins entire; 3 to 4 in. long, 5 to 1 in. broad; midrib stout; main nerves 8 to 10 pairs, curving acutely upwards to and along the margin; transverse nervules few, irregular; reticulations netted; petiole 25 in. long, scabrid-pubescent. Panicle leafy, terminal, pyramidal, thyrsoid, reaching 10 in. in length and 4 in. in diam., scabrid-pubescent; branches at about 1 in. intervals, pedunculate, ending in rather few-flowered trichotomous cymes; bracts leaf-like, lanceolate; bracteoles small, setaceous; pedicels slender, about ·2 in. long; buds clavate up to ·75 in. long. Calyx campanulate, scabrous-hispid without, glabrous and with large peltate glands within, cleft about two-thirds down, prominently nerved; lobes ovate, acute, ·2 to ·25 in long, ·1 in broad at base. Corolla-tube slender, pubescent, cylindric, 5 in. long; lobes spreading, obovate, the midlobe of the lower lip longer than the rest. Stamens long-exsert; filaments very slender, glabrous; anthers oblong, 075 in. long; cells parallel. Ovary rounded, obtuse; style very slender; stigmatic lobes very short. Fruit not seen.

KEDAH: at Terutau on Langkawi Island, Curtis 3789.

Only one specimen of this species is available. It is near C. Griffithianum, Clarke, but differs in the inflorescence, calyx, &c.

5. CLERODENDRON PENDULIFLORUM, Wall. Cat. 1795 (1828). A shrub; branchlets pale-brown, pubescent, quadrangular. Leaves membranous, opposite or ternate; ovate or lanceolate or oblong-lanceolate, long-acuminate at apex, acute at base; glabrous on both surfaces, glaucescent on the lower; margins entire or sometimes crenulate; 5 to 8 in. long, 1 to 3 in. broad; midrib slender; main nerves 5 to 7

pairs, distant, at once curving upwards to and along the margin; reticulations distant, obscure; petiole 5 to 2 in. long, slender, channelled. Panicle elongate, very lax, usually pendulous, glabrous or puberulous, long-pedunculate, reaching about 15 in. in length and up to 4 in. in greatest diameter; branches distant, opposite, bearing fewflowered umbellate cymules on slender peduncles 5 to 1 in. long; bracts linear, subulate, 15 to 2 in. long; pedicels slender, 1 to 15 in. long; flowers white; the rachis and calvx red. Calyx glabrous, deeply lobed; tube 1 in. long; lobes oblong-lanceolate, acute, 3 in. long; somewhat enlarged, reddish and reflexed in fruit. Corolla-tube funnel-shaped, curved, slender, 5 in. long, slightly glandular-pubescent; lobes oblongspathulate, rounded, the 2 lower slightly emarginate, about as long as the tube. Stamens exsert; anther-cells incurved so as slightly to overlap. Ovary cylindric, truncate; style slender; stigma shortly 2-fid. Drupe fleshy, globose, 25 to 35 in. in diam.; pyrenes 4, thin-walled. Seed usually one only; testa membranous, rugose; cotyledons thick, fleshy. Schauer in DC. Prodr. XI. 664; Clarke in Hook, f. Fl. Br. Ind. IV. 591; Bot. Mag. t. 3049 (in note).

Penang: at Penara Bukit and base of Penang Hill, Ridley 6947, 7181; Curtis; Deschamps. Perak: at Batu Kuran, Scortechini 1612. Selangor: Caves, Gua Batu, Ridley 8212.—Distrib. Burma (Arracan (Kurz), Tenasserim (Helfer (K.D.) 6047), Tavoy (Wallich 1795)), Nicobar Islands.

6. CLERODENDRON UMBRATILE, King & Gamble in Kew Bull. 110 (1908). A shrub or small tree, reaching 8 to 15 ft. in height; branchlets pale-brown, smooth, fistular. Leaves membranous; variable in shape, usually oblong or obovate or oblanceolate, the broadest part about twothirds up or even higher, long and rather suddenly acuminate at apex, usually rounded but sometimes attenuate at base; glabrous on both surfaces; entire; 8 to 16 in. long, 2 to 6 in. broad; midrib rather slender; main nerves 8 to 12 pairs, slender, the lowest pair usually from the base at an acute angle with the midrib, the rest at a wider angle curving upwards, the upper ones joining in a looped intramarginal nerve; transverse nervules irregular; reticulations netted; petiole 1 to 3 in. long, flaccid. Panicles from the uppermost axils, elongate, lax, somewhat curving, glabrous, usually 4 to 6 in. long and about 3 in. broad, on slender peduncles 4 to 7 in. long; branches divaricate, usually at right angles, with few-flowered cymules; rachis flattened and slightly winged; bracts leafy, lanceolate, up to 1 in. long; bracteoles many, linearsetaceous; pedicels slender, puberulous, 1 to 5 in. long; buds spathulate, curved, 1 in. long; flowers rather large, white tinged with pink; the calvx white or pale green turning red in fruit. Calyx large, globose or slightly puberulous, deeply divided nearly to the base; lobes ovate-acuminate, cuspidate, about 6 in. long by 25 in. broad, enlarging in fruit to 1.5 in. in diam., and then spreading. Corollatube slender, cylindric, 4 to 6 in. long; lobes spathulate, rounded at top, as long as tube. Stamens exsert; filaments glabrous; anthers 1 in. long; cells parallel. Ovary rounded, obtuse; style very slender; stigmas 2, short. Drupe black, smooth, fleshy, globose, 5 in. in diam.; pyrenes 4 or less, triangular-convex; endocarp crustaceous. Seeds rounded, 25 in. in diam.; testa membranous; cotyledons fleshy; radicle minute.

PERAK: at Kapayong Kinta, Wray 167; in dense jungle up to 3500 ft., King's Collector 722, 6959, 8268; Scortechini 2198; on Larút Hills, 3000 ft., and in Thaiping Hills, Derry 3704 (Curtis), 10712; at Kwala Dipang, Curtis 3116; at Bujong Malacca, Ridley 9700.—DISTRIB. Sumatra (in deep shade of forest at Grenoeng Trang and Kotta Djawa, Lampongs, Forbes 1333, 1585).

Ridley's No. 7594, from Ginting Bidai, Selangor, appears to be this species, but the leaves are rather narrower than usual and reach 12 in long by 2.5 in broad. The specimen is in fruit, which Ridley describes as black with a red calyx.

7. CLERODENDRON MYRMECOPHILUM, Ridley in Journ. Bot. XXXIII. 42 (1895). A sparingly branched shrub, about 3 ft. high; stem stout, terete, glabrous, fistular, the bark white; internodes swollen, hollow. Leaves opposite or alternate, membranous when dry; oblong, ellipticoblong or -oblanceolate, acute or obtuse at apex, acute obtuse or cordate at base; both surfaces glabrous, dull; margins entire; 6 to 12 in. long, 2 to 4 in. broad; midrib stout, broad, pale on the upper surface; main nerves 10 to 13 pairs, curving very gently upwards to meet in a looped intramarginal nerve; transverse nervules very few, irregular; reticulations not visible; petiole 7.5 to 2.5 in. long, fistular. terminal, shortly peduncled, pubescent, pyramidal thyrsus reaching 10 in. long and 3 to 4 in. broad; branches usually opposite, spreading, of rather few-flowered loose reddish-brown cymes; bracts and bracteoles linear-subulate, caducous reddish-brown; pedicels ·15 to ·2 in. long; buds clavate, curved; flowers ochreous-red. Calyx puberulous, about ·3 in. long, cleft nearly to the base; lobes erect, lanceolate acuminate with incurved tips; fruiting calyx enlarged to about 1 in. in diam; lobes triangular-acuminate, reflexed, red. Corolla-tube cylindric, about ·5 in. long, puberulous without; lobes as long as tube, obovate-oblong; the tips rounded. Stamens long exsert; filaments very slender, red; anthers oblong-reniform, '05 in. long; cells parallel. Ovary glabrous, obtuse; style as long as stamens, red; stigmatic branches slender. Drupe

globose, black, 5 in. in diam., with 4 to 1 pyrenes; pyrenes convex on back, nearly plane on the face, 3-ribbed, 3 to 4 in. long. Seed conform with the pyrenes; testa membranous; cotyledons thick, fleshy, unequal; radicle minute. Bot. Mag. t. 7887; Gard. Chron. XXXIII. Ser. 3, 196 (1903), and XXXV. Ser. 3, 237, t. 98 (1904).

JOHORE: at Jaffaria, G. King. SINGAPORE: in dense wet woods at Choa-Chu-kang, Ridley.

The hollow stems are swollen at the internodes, and there form nests for ants belonging to the genus *Pheidole*, Fabricius. The same phenomenon occurs in *C. fistulosum*, Becc., of Borneo, in *C. formicarum*, Gürke, a native of Tropical Africa (Hook. f. in Bot. Mag. *l. c.*), and in the next species here described.

8. CLERODENDRON CURTISH, H. H. W. Pearson in Kew Bull. 142 (1901). A small shrub, usually 2 to 3 ft., sometimes reaching 6 ft. high; stem thick, fistular, striate, minutely puberulous. Leaves opposite, membranous; elliptic, elliptic-oblong or -obovate, acuminate at apex, broadly cuneate rounded or sometimes slightly cordate at base; both surfaces somewhat puberulous, upper glabrescent when old; margins entire or undulate-denticulate; 4 to 12 in. long, 3 to 6 in. broad; midrib stout, pubescent; main nerves 9 to 12 pairs, curving upwards to and along the margin where they anastomose; transverse nervules fairly regular and prominent; reticulations inconspicuous; petiole thick, striate, puberulous, 1 to 4.5 in. long. Panicles terminal, thyrsoid, pubescent, muchbranched, reaching 6 to 8 in. long and 4 to 5 in. broad; the rachis and branches angular; branches opposite, with peduncles .75 to 1 in. long and corymbose cymes of many flowers; bracts leafy, the lower large, the upper obovoid or spathulate; bracteoles small, subulate; pedicels slender, 15 in. long; buds clavate, 5 to 75 in. long; flowers bright yellow, tinged with red; the calvx crimson. Calyx cleft three-quarters down; lobes lanceolate, acute, 3-nerved, pubescent, ciliate, 25 in. long, ·1 in. broad, with usually several rather obscure peltate glands. Corollatube cylindric, slender, 5 to 7 in. long, puberulous, glandular; lobes obovate or elliptic, narrow at the base, 2 to 3 in. long. Stamens longexsert; filaments glabrous; anthers reniform, under 05 in. long; cells parallel. Ovary glabrous, obtuse; style very slender; stigmatic branches short. Drupe not seen.

Perak: at Kota, Wray 3246; Lamjubus, Scortechini 1555; on Larút Hills, 3000 ft., Derry (Curtis) 3704; in low swampy places at Larút, King's Collector (Kunstler) 1966, 2507. Dindings: Bruas, in damp places, Curtis 3441. Selangor: Klang, Ridley 10198.

Mr. Ridley informs us that this is the same plant as Clerodendron breviftorum, Ridley in Journ. Bot. XXXII. 43 (1895), which was described from specimens

collected at Kampong Chin-Chin, Ula Batu Pahat, Johore, by Lake & Kelsall in 1892. Unfortunately, there are no specimens in the herbaria at Kew or Calcutta, so we hesitate to alter the name. If the identification proves correct, it is Ridley's name that must take precedence. This is one of the species whose fistular stems contain ants' nests. C. macrophyllum, Hook. MS. in Herb. Kew, a large-leaved, handsome species from Java and Borneo, is very closely allied to this species.

9. CLERODENDRON SERRATUM, Spreng. Syst. Veg. II. 758 (1825); Don Prodr. Fl. Nep. 103; Wall. Cat. 1809; Ham. in Trans. Linn. Soc. XVII. 187; Schauer in DC. Prodr. XI. 664; Dalz. & Gibs. Bomb. Fl. 200; Wight Ic. t. 1472; Brandis For. Fl. 364; Kurz For. Fl. II. 267; Blume Bijdr. 810; Miq. Fl. Ind. Bat. II. 873; Clarke in Hook. f. Fl. Br. Ind. IV. 592; Trimen Fl. Ceyl. III. 360; Cooke Fl. Bomb. II. 432; Prain Beng. Plants 835. C. ternifolium, Don l. c. C. macrophyllum, Sims Bot. Mag. t. 2536; Reich. Fl. Exot. t. 209; Schauer l. c. 674. C. ornatum, Wall. Cat. 1811; Schauer l. c. 675. C. herbaceum, Wall. Cat. 1815; Schauer l. c. 675. Volkameria serrata, Linn. Mant. 90; Roxb. Fl. Ind. III. 62. V. herbacea, Roxb. Hort. Beng. 46.—Distrib. India, Burma, and Ceylon.

VAR. Wallichii, C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 592. A shrub, reaching 8 to 10 ft. in height (Kunstler); branches somewhat herbaceous, smooth, fistular; branchlets smooth, angled and with raised lines decurrent from the nodes. Leaves opposite, almost membranous when dry; obovate-lanceolate or oblanceolate, shortly acuminate at apex, acuminately narrowed at base; both surfaces glabrous; margins distantly serrate or denticulate, sometimes entire; 4 to 8 in. long, 1.5 to 3 in. broad; midrib strong, prominent beneath; main nerves 6 to 10 pairs, at first straight, then curving upwards to and along the margin; reticulations irregular; petiole up to about 6 in. long or none when bordered by the decurrent margins of the blade. Panicle terminal, erect, elongate, minutely pubescent, reaching 10 to 12 in. in length and 2 to 2.5 in. in breadth; the branches many, divaricate, subdichotomous, many-flowered; bracts foliaceous, large, ovate or obovate. acuminate or obtuse and apiculate; bracteoles many, lanceolate or finally linear; pedicels slender, about 1 in. long; buds spathulate, curved; flowers greyish-white to blue, the lower lobe darker than the rest. Calyx campanulate; lobes extremely short, rounded, minutely apiculate; the fruiting calyx cup-shaped, almost truncate, not enlarged. Corollatube cylindric, slightly narrowed below the oblique throat, 2 to 25 in. long, glabrous without, villous within; lips 2, upper of 2 oblong, flat, obtuse lobes, lower of 3 lobes, the side ones similar to the upper, the midlobe spathulate, concave, emarginate, all about .25 in. long. Stamens very long-exsert, much curved; filaments villous at the base and

thickened; anthers oblong, ·075 in. long; cells parallel. Ovary glabrous, truncate at top; style very long, slender; stigmas 2, rather long. Drupe purple, succulent, when dry ·25 in. long, and as much broad at top, with 4 (or less) well-marked pyrenes; pyrenes obovoid, plane or concave on inner faces; endocarp crustaceous. Seeds obovoid, ·15 to ·2 in. long, concave on the inner, convex on the outer face, which is wrinkled; testa thin; cotyledons fleshy, unequal, one convex, the other concave; radicle minute. C. farinosum, Wall. Cat. 1810 (not Volkameria farinosa, Roxb.). C. divaricatum, Jack in Mal. Misc. I. 2, and in Hook. Bot. Misc. II. 89; Schauer in DC. Prodr. XI. 674.

Perak: Wray 1871; at Ipoh, Curtis 3198, 3328; at Ipoh and Baton Gaja, Deschamps; near Thaiping, Scortechini 507; at Goping, King's Collector (Kunstler) 480. Selangor: Goodenough 10478; Cecil C. Smith.—Distrib. India (Sikkim, Assam and Burma), Sumatra, Java, Celebes, Cambodia.

We have not followed Clarke in quoting C. javanicum, Walp. Rep. IV. 113, as we consider the description therein given does not sufficiently fit our specimens.

10. CLERODENDRON INFORTUNATUM, Linn. Sp. Pl. 637 (1753). A shrub, usually about 3 to 8 ft. high, occasionally a small tree, gregarious; branchlets obtusely quadrangular, slightly furrowed, clothed with vellowish pubescence. Leaves somewhat coriaceous; ovate, acuminate at apex, rounded or cordate at base; both surfaces roughly strigosely hairy, lower sometimes with small obscure round glands; margins dentate or denticulate, rarely entire: 4 to 10 in. long, 3.5 to 8 in. broad; midrib prominent; main nerves also prominent, about 8 pairs, the lowest two pairs near the base spreading, the rest gradually curving upwards, all joined by prominent transverse nervules which branch and anastomose; reticulations netted; petiole 1 to 4 in. long, densely pubescent. Panicle terminal, pyramidal, spreading, 6 to 12 in. long and broad, densely tawny-pubescent; the branches trichotomous, ending in many-flowered cymules; bracts leafy, ovate-lanceolate, deciduous; bracteoles lanceolate, also deciduous; pedicels slender, 25 to 5 in. long; buds clavate, rounded at top; flowers white, tinged with pink; the calvx red at the base (Ic. Roxb.). Calyx cleft nearly to the base, silky pubescent, often with scattered, large, round, peltate glands; the lobes lanceolate, acute, subcrect, ·3 to ·4 in. long; fruiting calyx enlarged, crimson, reaching 1.5 in. in diam. when spread out. Corolla densely pubescent without; tube cylindric, slender, 5 to 75 in. long; lobes spreading, as long as the tube, the 2 upper somewhat spathulate, the 3 lower ovate, oblong, rounded. Stamens long-exsert; filaments glabrous; anthers oblong; the cells parallel. Ovary rounded, glabrous;

style slender; stigmas 2, short. Drupe nearly globose, shining, black, 3 in. in diam., with 4 to 1 pyrenes; pyrenes convex without; the endocarp crustaceous. Seeds conform to the drupe; testa membranous; cotyledons fleshy. Gaertn. Fruct. I. 271, t. 57, fig. 1; Lamk. Ill. t. 544; Wall. Cat. 1796; Schauer in DC. Prodr. XI. 667; Dalz. & Gibs. Bomb. Fl. 200; Wight Ic. t. 1471 (?); Bedd. Fl. Sylv. CLXXIII., and Anal. XXII. fig. 1; Brandis For. Fl. 363; Kurz For. Fl. II. 267; Miq. Fl. Ind. Bat. II. 876; Trimen Fl. Ceyl. III. 361; Clarke in Hook. f. Fl. Br. Ind. IV. 594; Cooke Fl. Bomb. II. 432; Prain Beng. Plants 835. C. viscosum, Vent. Jard. Malm. t. 25; Bot. Mag. t. 1805; Bot. Reg. t. 629. C. cordatum, Don Prodr. Fl. Nep. 103; Schauer l. c. 674. Volkameria infortunata, Roxb. Fl. Ind. III. 59. Clerodendron, Linn. Fl. Zeyl. 232; Burm. Thes. Zeyl. 66.

SIAMESE STATES: Poongah, Curtis 2949. SINGAPORE: Schomburgk 106.—DISTRIB. India, Burma, Ceylon, Java, Moluccas.

We have not quoted "Peragu," Rheede Hort. Mal. II. t. 25, which Clarke & Miquel consider to be this species. Schauer quotes it under C. villosum, and it seems to us to resemble that species more closely in the leaves and calyx. C. villosum has not hitherto been recorded from the Western Peninsula, but Gamble has specimens collected in the Wynaad region of the Nilgiris which seem to be it and not C. infortunatum. We do not feel very sure that the plant figured in Wight Ic. t. 1471 is not C. villosum rather than C. infortunatum.

11. CLERODENDRON VILLOSUM, Blume Bijdr. 811 (1826). A shrub, usually about 3 to 5 ft. high (10 to 15 ft., King's Collector; 15 to 20 ft., Kurz); branchlets stout, obtusely quadrangular, densely tawny-villous. channelled on the sides. Leaves chartaceo-coriaceous; ovate acuminate at apex, cordate or truncate at base, sometimes slightly cuneate; both surfaces tawny-villous or velvety tomentose, those of young leaves white-silky; margins entire; 4 to 8 in. long, 3 to 5 in. broad; midrib stout, prominent; main nerves 5 to 6 pairs, the lowest pair from the base spreading at right angles to the midrib with about 8 to 10 nerves from the lower side, the next pair from close above it curving upwards with also about 8 to 10 nerves from the lower side, the rest more distant and similarly curving; transverse nervules distant, pale; reticulations obscure; petiole 2 to 6 in. long, densely tawny-pubescent. Panicle terminal, pyramidal, thyrsoid, spreading, reaching 4 to 7 in. long and 6 in. broad, densely tawny-pubescent; branches long peduncled, ending in trichotomous cymes of rather few flowers; bracts leafy, ovate-lanceolate, acuminate, persistent; bracteoles many, small, lanceolate, deciduous; pedicels 1 to 2 in. long; buds short, clavate, rounded; flowers white or cream-coloured, tinged with red. Calyx cleft about

two-thirds down, with large prominent, scattered, rounded glands; lobes ovate-lanceolate, cuspidate-acuminate, 25 in. long; fruiting calvx white, much enlarged, nearly 1 in. in diam. when opened, completely embracing the fruit. Corolla villous; tube cylindric, 2 to 3 in. long: lobes obovate-oblong, as long as tube. Stamens long-exsert; filaments slender; anthers oblong-reniform; cells parallel. glabrous, obtuse; style slender, longer than the stamens; stigmatic lobes 2 very short. Drupe globose, shining, black when ripe (King's Collector), white (Jack), slightly succulent, with 4 to 1 pyrenes; pyrenes convex on the outer, flattened on the two inner, faces, 25 in, long; endocarp crustaceous, reticulate. Seeds oblong, curved, 15 to 2 in. long; testa thin; cotyledons fleshy, curved, somewhat unequal; radicle minute. Schauer in DC. Prodr. XI. 667; Kurz For. Fl. II. 268; Mig. Fl. Ind. Bat. II. 877; Clarke in Hook. f. Fl. Br. Ind. IV. 595. C. molle, Jack in Mal. Misc. I. 15, and in Hook. Bot. Misc. I. 283 (not of H.B.K.). C. velutinum, Wall. Cat. 1797. C. trichotomum, Wall. Cat. 6315 B (not of Thunb.).

Penang: Curtis 101; roadsides on the hill, Deschamps; near top of the hill, G. King. Perak: Scortechini 1389; in open forests, at 100 to 300 ft. alt., King's Collector (Kunstler) 5191, 5647, 8831. DINDINGS: Pangkore, Scortechini 63. Malacca: Griffith 6051; Maingay (K.D.) 1187; Hervey; Derry 148. SINGAPORE: Cuming 2415; Wallich 1797; Murton 124; Schomburgk 66; Kurz; G. King; Deschamps.—Distrib. Burma (Martaban, fide Kurz; Mergui, Griffith), Java, Sumatra, Philippines.

12. CLERODENDRON COLEBROOKIANUM, Walp. Rep. IV. 114 (1844). A large shrub, sometimes a small tree with silver-grey bark; branchlets glabrous, or the uppermost pubescent, quadrangular, furrowed below the leaf-petioles, more or less fleshy and soft; innovations tawnypubescent. Leaves membranous when dry, opposite; broadly ovate, acute at apex, cordate at base, the sinus rather broad; both surfaces glabrous except the nerves beneath which are puberulous, a few large glands on the lower surface especially near the apex of the petiole; margins entire or sinuate; 5 to 12 in. long, 4 to 10 in. broad; midrib prominent; main nerves 8 to 10 pairs, the lowest pair from just above the petiole, with about 5 to 6 branch-nerves on the outer side, all spreading and curving only close to the margin; transverse nerves faint, as are the netted reticulations; petiole 2 to 8 in. long, cylindric, smooth. Panicles large, spreading, terminal, pubescent, reaching 1 to 2 ft. in diam.; branches long-peduncled, ending in corymbose, close, many-flowered cymes; bracts lanceolate, caducous; bracteoles many, lanceolate; pedicels short, 1 to 2 in. long; buds clavate, often 1 in. long; flowers white to rose-purple. Calyx pubescent, 15 to 25 in. long, cleft half-way down; tube with often a large gland under each lobe; lobes triangular-lanceolate, acute; fruiting calyx scarcely enlarged. Corolla-tube cylindric, slender, nearly glabrous, 75 to 1 in. long; lobes elliptic or obovate, 25 in. long. Stamens long-exsert; filaments glabrous; anthers oblong-reniform, 075 in. long; cells parallel. Ovary glabrous, obtuse; style very long and slender; stigmatic lobes 2, short. Drupe glabrous, blue, 3 to 35 in. in diam. with usually 4 pyrenes. Schauer in DC. Prodr. XI. 672; Clarke in Hook. f. Fl. Br. Ind. IV. 594. C. glandulosum, Colebr. MS. ex Wall. Cat. 1806; fide Walp.; Lindl. in Bot. Reg. t. 19 (1844) in note; Schauer l.c.

SINGAPORE: Lobb.—DISTRIB. India (Sikkim, Assam, Burma). It is not quite certain that it is really indigenous in the Peninsula; Lobb's specimen may have been from a cultivated plant.

Var. Forbesii, King & Gamble. Leaves and branchlets puberulous; panicles reduced to a terminal corymb of closely packed flowers 4 to 5 in. long; no glands on calyx or midrib of leaf; flowers dark scarlet.

Sumatra (near Kagoengan Ratoe, Lampongs, at 500 ft. alt., Forbes 1786).

13. CLERODENDRON PANICULATUM, Linn. Mant. 90 (1771). A shrub, reaching 4 to 6 ft. in height; branchlets quadrangular, channelled below the leaf-petioles, glabrous or puberulous, the bases of the leaves (as also the branches of the inflorescence) joined at the nodes by a belt of soft brown hairs. Leaves membranous; variable in shape, usually orbicular or ovate, from almost simple to deeply 3- to 7-lobed, cordate or hastate at base, acuminate at apex and at the apices of the lobes; upper surface sparsely hispid or glabrescent, lower pale and densely covered with round peltate glands; margins entire or minutely denticulate; 4 to 8 in. in diam.; midrib stout, ribs usually 3 pairs radiating from the base, the lower deflexed; main nerves of middle lobe 5 to 6 pairs, of side lobes about the same but stronger on the lower side; reticulations slender, netted; petiole variable, 1 to 6 in. or more. Panicles terminal, thyrsoid, pyramidal, spreading, 4 to 12 in. long by 3 to 8 in. broad. with opposite branches bearing trichotomous cymes with racemose reddish branches, the rhachises channelled; bracts foliaceous, like the leaves but smaller; bracteoles small, linear, numerous, red; pedicels slender, red. ·25 to ·75 in. long; buds clavate, the head globose; flowers red, orange or almost white; the calyx red. Calyx divided nearly to the base; lobes oblong-lanceolate, acute, 15 to 2 in. long, much enlarged in fruit, stellate, the lobes closely embracing the drupe. Corolla-tube slender, cylindric, puberulous, 5 to 7 in. long; lobes nearly equal, elliptic, 2 to ·4 in. long, patent. Stamens long exserted; filaments red, glabrous;

anthers oblong-reniform; cells parallel. Ovary glabrous, cylindric; style very slender; stigmatic branches short. Drupe obovoid, 1- to 4-pyrened (usually 1 only); pyrenes pyriform; endosperm crustaceous, reticulate. Seeds conform to the pyrene; testa membranous; cotyledons unequal, fleshy; radicle very small. Ait. Hort. Kew. ed. 2, IV. 64; Vahl Symb. II. 74; Bot. Reg. t. 406; Reichb. Fl. Exot. t. 208; Hassk. Pl. Jav. Rar. 488; Schauer in DC. Prodr. XI. 668; Blume Bijdr. 811; Miq. Fl. Ind. Bat. II. 879; Clarke in Hook. f. Fl. Br. Ind. IV. 593; Hook. f. Bot. Mag. t. 7141. C. pyramidale, Andr. Bot. Rep. t. 628; Wall. Cat. 1802. C. splendidum, Wall. Cat. 1803. Volkameria angulata, Lour. Fl. Cochinch. 389.

Kedah: on low ground near sea-level, King's Collector (Kunstler) 1792. Penang: Wallich 1802; at Tanjong Bunga, Curtis 313. Perak: Wray 42, 2435; at L. W. Resthouse, Scortechini 915; at Ipoh, Deschamps; at Larút, on rocks at 300 to 800 ft. alt., King's Collector 6437. Selangor: gap on Pahang side, at 2000 to 3000 ft. alt., Curtis 3759. Malacca: Griffith 6050. Singapore: Ridley; gardens, hedges, and waste places, Deschamps; Bukit Mandai, Goodenough.—Distrib. Siam (Hemsley in Journ. Linn. Soc. XXVI. 262).

14. CLERODENDRON SIPHONANTHUS, Br. in Ait. Hort. Kew. ed. 2, IV. 65 (1812). An erect, usually single-stemmed, little-branched shrub, reaching 4 to 8 ft. in height; branchlets channelled, smooth-barked. Leaves membranous when dry, verticillate, 3- to 5-nate or opposite, the bases of the petioles joined by a pubescent ring; narrowly lanceolate or oblong-lanceolate, shortly acuminate at apex, attenuate at base; both surfaces glabrous, the lower pale; margins entire or sinuate, recurved; 4 to 8 in. long, 5 to 1 in. broad; midrib prominent; main nerves 10 to 12 pairs, very short, straight, joining prominent looped intramarginal nerves which start from the base; transverse nervules very few; petiole none or extremely short. Panicle terminal, thyrsoid, leafy, reaching 8 to 18 in. in length, and 4 to 6 in. in diam.; branches red, verticillate, of lax peduncled few-flowered cymes; bracts linearlanceolate, 5 in. long; bracteoles subulate; pedicels 5 to 1.5 in. long, puberulous; buds long, clavate; flowers white, changing to creamcolour. Calyx puberulous, divided three-fourths down; lobes ovatelanceolate, acute, densely clothed within with minute round glands, ·3 to ·4 in. long, ·15 in. broad; fruiting calyx greatly enlarged, leathery, up to 1.5 in. in diam., crimson. Corolla-tube funnel-shaped, glabrous, curved, 3 to 4.5 in. long, about 1 in. broad below, widening above; lobes spreading, obovate- or oblong-obtuse, 3 to 4 in. long. Stamens long exsert; filaments slender, glabrous; anthers oblong, 1 to 15 in. long; cells parallel. Ovary glabrous, obtuse; style very long, slender; stigmatic branches short, rather thick. Drupe 1- to 4-lobed according to the number of pyrenes, about '5 in. in diam.; exocarp fleshy, dark blue; pyrenes rounded except a slight flattening on the inner side, smooth, '4 in. by '25 in.; endocarp crustaceous. Seeds conform to the pyrenes; testa thin, soft; cotyledons very fleshy; radicle very small. Wall. Cat. 1784; Wight Ill. t. 173; Schauer in DC. Prodr. XI. 670; Brandis For. Fl. 364; Dalz. & Gibs. Bomb. Fl. Suppl. 69; Miq. Fl. Ind. Bat. II. 883; Clarke in Hook. f. Fl. Br. Ind. IV. 595; Cooke Fl. Bomb. II. 433; Prain Beng. Plants 836. C. verticillatum, Don Prodr. Fl. Nep. 102; Schauer l.c. 671. Siphonanthus indica, Willd. Sp. Pl. I. 606; Lamk. Ill. t. 79, fig. 1; Roxb. Fl. Ind. III. 67. S. angustifolia, Willd. l. c. Ovieda mitis, Burm. Fl. Ind. 136, t. 43, figs. 1, 2.

Perak: at Trong, Wray 3170.—Distrib. India, Burma, Java, Sumatra, Celebes, Siam (Schomburgk 302). Often cultivated in gardens.

15. CLERODENDRON RIDLEYI, King & Gamble in Kew Bull. 111 (1908). A small slender tree, reaching 15 ft. in height and 2 to 3 in. in diam.; branches smooth, pale brown; branchlets (also rachis of inflorescence) quadrangular, shining. Leaves opposite, membranous; elliptic, elliptic-lanceolate or ovate, caudate-acuminate at apex, rounded or cuneate at base; both surfaces glabrous, the lower pale; margins entire; 3 to 7 in. long, 1 to 3 in. broad; midrib slender, prominent beneath; main nerves 5 to 7 pairs, the lowest pair from close to the base at an acute angle with the midrib, the rest more spreading, meeting in a looped intramarginal nerve; transverse nervules few, irregular, other reticulations not visible; petiole slender, 75 to 2 in. long, winged by decurrent ridges from the base of the blade. Panicle terminal, few-flowered, reaching with the peduncle at most 6 in. long and 3 in. broad; branches divaricate, 1 to 1.5 in. long; bracts leafy, lanceolate, acuminate, caducous; bracteoles linear; pedicels slender, ·25 in. long; buds very long, clavate; flowers white (Ridley) or pale yellow (Kunstler). Calyx erect, deeply divided; lobes glabrous, lanceolate, caudate-acuminate, 5 to 7 in. long, often with scattered large peltate glands; fruiting calvx enlarged, enclosing the fruit, 1.5 in. in diam. when opened out, deep red in colour. Corolla-tube cylindric. slightly funnel-shaped at top, 3 to 3.5 in. long, very slender; lobes obovate, obtuse, 5 in. long, subequal. Stamens long-exsert; anther-cells parallel. Ovary glabrous, obtuse, 4-lobed; style very long, slender; stigmatic lobes very short. Drupe deep red, smooth, globose, fleshy, 5 in. in diam. with 4 to 1 pyrenes; pyrenes pyriform, slightly ribbed; endocarp crustaceous. Seeds conform to the pyrenes; testa membranous; cotyledons very thick, fleshy.

PERAK: in dense forest near Larut, up to 300 ft., King's Collector 2944, 3988. Selangor: at Batu Tiga, Ridley 11862.

CLERODENDRON LOBBII, C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 590 (1885), is a climbing shrub which, in all probability, does not belong to this genus. Mr. Ridley informs us that it is very common in Borneo, and that he thinks Lobb's specimen must have been collected at Kuching and not in Penang. It is a very handsome, striking plant, and has been cultivated. It has the upper leaves of the spray bright red, flowers of a light salmon-red, and a horn-shaped fruit about 2 in. long. There is a good picture of it in Miss North's Gallery at Kew, to which Mr. Ridley has drawn our attention.

10. VITEX, Linn.

Trees or shrubs. Leaves opposite, digitately 3- to 7-foliolate, sometimes 1-foliolate; leaflets usually entire, sometimes dentate, generally petiolulate. Flowers blue, white or yellow, in sessile or pedunculate cymes forming terminal or axillary or both terminal and axillary panicles or corymbs; bracts usually small, often caducous. Calyx campanulate or tubular funnel-shaped, usually truncate or shortly 5-toothed, sometimes bilabiate with 3 to 5 teeth. Corolla small, 2-lipped; tube long or short; upper lip usually of 2, lower of 3, lobes, the central lobe of the lower lip much the longest. Stamens 4 didynamous, usually exserted; anther-cells various, always attached at the tip only, generally parallel at first, afterwards divaricate. Ovary 2- to 4-celled, 4-ovuled; style filiform; stigma bifid. Fruit a globose or ovoid or obovoid drupe; supported by the more or less enlarged calyx; mesocarp generally fleshy; endocarp a bony pyrene, normally 4-celled and 4-seeded, but often with some of the cells suppressed, the base of the pyrene sometimes hollowed in a cavity. Seeds obovate or oblong; albumen 0; cotyledons usually fleshy; radicle inferior. — DISTRIB. About 120 species, in all tropical and warm temperate regions.

Inflorescence terminal, with occasional additional branches in the axils of uppermost leaves:—

Leaves without wings to the petioles :-

Shrubs or small trees; leaves membranous, grey-pubescent beneath :—

Leaves 1- to 3-foliolate; margins entire; petiole under 1 in. long; calyx under 1 in. long

Leaves 3- to 5-foliolate; margins sometimes crenate; petiole over 1 in. long; calyx over 1 in. long

Trees; leaves chartaceous or coriaceous, not grey-pubescent beneath:—

Leaves 1-foliolate, coriaceous:-

Leaves 1.5 to 4.5 in. broad, with a prominent intramarginal nerve; panicle-branches spicate ... 1. V. trifolia.

2. V. Negundo.

3. V. holophylla.

Leaves 2 to 3 in. broad, no prominent intramarginal	
nerve: panicle-branches racemose	4. V. Clarkeana.
Leaves 3-foliolate; leaflets petiolulate:-	
Leaves coriaceous; inflorescence of stout panicles up	
to 8 in. long, the flowers clustered	5. V. coriacea.
Leaves chartaceous; inflorescence of slender panicles,	
the flowers not clustered	6. V. siamica.
Leaves 3- to 5-foliolate, chartaceous or coriaceous:-	
Leaflets sessile or subsessile; inflorescence densely	
tawny-pubescent; bracts large, conspicuous	7. V. pubescens.
Leaflets petiolulate; inflorescence thinly cinereous-	
tomentose; bracts very small or none:-	
Leaflets long-acuminate; panicle-branches slender,	
with few-flowered cymules; corolla-tube without a	
ring of hairs within	8. V. heterophylla.
Leaflets short-acuminate; panicle-branches stout,	
with many-flowered cymules; corolla-tube with a	
ring of hairs within	9. V. sumatrana
Leaves with winged petioles, the wings broad:—	var. urceolata.
Leaflets long-lanceolate, scabrous-dotted, under 2.5 in.	
broad	10. V. pteropoda.
Leaflets elliptic or elliptic-obovate, over 3 in. broad, not	
scabrous-dotted	11. V. per-alata.
Inflorescence axillary:—	
Leaves 3- to 5-foliolate, glabrate; cymes pedunoled, reaching	
4 to 5 in. long	12. V. glabrata.
Leaves 3-foliolate; cymes sessile, under 1.5 in. long:—	
Leaves and cymes densely tawny-pubescent; drupe with a	
hard-ridged pyrene, having 3 to 4 seed-bearing cells above	
and an empty cavity below:—	
Calyx-lobes oblong-lanceolate, 25 in. long, conspicuous;	
bracts large, conspicuous; leaves large	13. V. longisepala.
Calyx-lobes short, acute, inconspicuous; bracts minute,	
caducous; leaves small	14. V. vestita
Leaves glabrate; cymes sparingly fulvous-hairy; calyx	
2-lipped	15. V. gamosepala.

We have not maintained Clarke's subgenus Glossocalux because the species V. gamosepala, for which it was established, is so very nearly allied to V. longisepala and V. vestita that, if any subgenus were necessary, it ought to be one which would include these three, so different in inflorescence and fruit from the rest of the genus, and closely allied to Premna and Gmelina.

1. VITEX TRIFOLIA, Linn. Sp. Pl. 638 (1753). A shrub or small tree; bark smooth, pale grey; branchlets quadrangular, covered with an appressed hairy tomentum. Leaves membranous; 1- to 3-foliolate; the terminal leaflets sessile or very shortly petiolulate, the lateral leaflets sessile; leaflets elliptic or obovate, or almost orbicular (especi-

ally when 1-foliolate), obtuse or acute at apex, rounded or cuneate (especially the terminal, if 3) at base; upper surface glabrous, lower densely white-tomentose; margins entire; end leaflet 1 to 3 in. long, ·5 to 1·25 in. broad, lateral leaflets smaller; main nerves 8 to 12 pairs, inconspicuous; petiole slender, 5 to 1 in. long. Panicles terminal, oblong, white-tomentose, reaching 1 to 5 in. in length; the rachis subquadrangular; cymes opposite, up to 1 in. long, brachiate; bracts linear, minute; flowers lavender to blue. Calyx sessile, campanulate, ·075 to ·1 in. long; tube ribbed from the teeth, white-tomentose; teeth 5, regular, acute, very small. Corolla ·25 to ·35 in. long; tube scaly-pubescent without, villous within at the insertion of the stamens; upper lip of 2 short rounded lobes, lower of 3 lobes, the lateral lobes 06 in. long, the midlobe longest, 125 in. long, villous, hairy within and usually incurved. Stamens exsert; filaments hairy-villous near the base; anther-cells curved. Ovary rounded, depressed, glandu-Drupe ellipsoid, depressed at top, 2 in. in diam., slightly ribbed, glandular-dotted, half-enclosed in the somewhat enlarged calyx. Linn. f. Suppl. 293; Lamk. Dict. II. 613; Roxb. Fl. Ind. III. 69; Bot. Mag. t. 2187; Wall. Cat. 1743; Schauer in DC. Prodr. XI. 683; Blume Bijdr. 812; Miq. Fl. Ind. Bat. II. 859; Benth. in Fl. Austral. V. 66; Bedd. Fl. Sylv. CLXXII; Brandis For. Fl. 370; Clarke in Hook. f. Fl. Br. Ind. IV. 583; Trimen Fl. Ceyl. III. 356; Cooke Fl. Bomb. II. 428; Prain Beng. Plants 833; Koord. & Val. Bijdr. VII. 200. V. ovata, Thunb. Fl. Jap. 257; Lamk. l. c.; Hook. & Arn. Bot. Beech. Voy. 206, t. 47. V. repens, Blanco Fl. Filip. 513. V. incisa, Wall. Cat. 1746 (partly, not of Lamk.). V. Agnus castus var., Kurz For. Fl. II. 269. "Lagondium vulgare," Rumph. Herb. Amb. IV. 48, t. 18. "Caranosi," Rheede Hort. Mal. II. t. 11.

Perak: Scortechini 644, 1459. Malacca: Griffith; Maingay (K.D.) 1206; Hervey. Singapore: at Pulau Obun, Kunstler 57.
—Distrib. India, Ceylon, Malay Archipelago, North Australia, Japan.

2. VITEX NEGUNDO, Linn. Sp. Pl. 638 (1753). A large shrub or small tree; bark thin, grey; branchlets quadrangular, covered with an appressed hairy tomentum. Leaves membranous; 3- to 5-foliolate, the terminal leaflet petiolulate (up to .75 in. long), the lateral leaflets shortly petiolulate (usually about .25 in.), sometimes nearly or quite sessile; leaflets lanceolate, acuminate at apex, attenuate at base; upper surface nearly glabrous, lower densely white-tomentose; margins entire or sometimes coarsely crenate; end leaflet 2 to 4 in. long, .5 to 1.25 in. broad, lateral leaflets shorter; main nerves about 15 pairs with a few secondary nerves between; petiole slender, 1 to 1.5 in. long, white-tomen-

Panicles 1 to 3 together, terminal, oblong-pyramidal, whitetomentose, reaching 12 in. long; the rachis quadrangular; peduncle of each branch variable, 1 to 4 in. long; cymes opposite, reaching 1 in. in length, but usually shorter, brachiate, at first dichotomous; bracts linear, short, the lowest somewhat leafy; flowers blueish-purple. Calyx sessile, campanulate: tube 1 to 15 in. long, faintly ribbed, enlarged in fruit; teeth regular, acute, 05 in. long, sometimes slightly cuspidate. ·25 to ·35 in. long; tube scaly-pubescent and slightly glandular without, villous within at the insertion of the stamens and on the midlobe of the lower lip; upper lip 2-lobed, lobes rounded, recurved; lower lip 3-lobed, the midlobe much the longest and obtuse at tip, lateral lobes spreading. Stamens exsert; filaments villous at the base; anther-cells Ovary rounded, very slightly glandular. Drupe ovoid. curved. depressed at top, 2 in. in diam., slightly ribbed, glandular-dotted. Roxb. Fl. Ind. III. 70; Wall. Cat. 1744; Schauer in DC. Prodr. XI. 684; Wight Ic. t. 519; Bedd. Fl. Sylv. CLXXI; Brandis For. Fl. 369; Mig. Fl. Ind. Bat. II. 890; Clarke in Hook. f. Fl. Br. Ind. IV. 583; Trimen Fl. Cevl. III. 357; Cooke Fl. Bomb. II. 428; Prain Beng. Plants 833; Koord. & Val. Bijdr. VII. 201. V. bicolor, Willd. Enum. Hort. Berol. 660; Schauer l. c. 683; Dalz. & Gibs. Bomb. Fl. 201. V. arborea. Desf. Cat. Hort. Paris, 391. V. paniculata, Lamk. Dict. II. 612; Roxb. l. c. 71. "Lagondium litoreum," Rumph. Herb. Amb. IV. t. 19. "Bemnosi," Rheede Hort. Mal. II. t. 12.

PETANI: at Tomoh, Machado (Ridley 5813). MALACCA: Griffith. SINGAPORE: Ridley 4118. — DISTRIB. India, Ceylon, Malay Archipelago. Ridley thinks it is probably not really indigenous in the Peninsula.

3. VITEX HOLOPHYLLA, Baker in Kew Bull. 25 (1896). A small tree; branches with yellowish-white bark; branchlets also yellowish, shining, obtusely quadrangular; innovations tawny-tomentose. Leaves opposite, coriaceous, simple; ovate-lanceolate or ovate-oblong, acuminate at apex, rounded at base; both surfaces glabrous, upper olive-green, lower ferruginous; margins entire; 4 to 12 in. long, 1·5 to 4·5 in. broad; midrib stout, prominent, keeled above; main nerves 7 to 9 pairs at an angle of 70° with the midrib, curving upwards to meet in an intramarginal looped nerve, all slightly impressed above, raised beneath; secondary nerves many, irregular; reticulations prominent, netted; petiole ·75 to 1·5 in. long, prominently jointed at both ends, younger ones puberulous. Cymes in terminal panicles of rather long glomerulate spikes reaching 6 to 7 in. long and 3 to 4 in. broad; densely tawny-tomentose when young, afterwards glabrate; bracts lanceolate or elliptic-lanceolate, caducous, ·1 to ·2 in. long; bracteoles 2, much smaller; flowers in each

glomerule about 3 on each side, sessile. Calyx campanulate, tawny-pubescent and glandular, 1 in. long; lobes 5 subequal, deltoid; calyx in fruit much accrescent, cup-shaped, truncate, 5 in. in diam. Corollatube funnel-shaped, pubescent and glandular without, sparsely villous within; 2-lipped, upper lip shortly 2-lobed, the lobes rounded, reflexed, lower lip 3-lobed, midlobe long, very villous within. Stamens exsert; filaments slightly villous; anther-cells divaricate, often recurved. Ovary rounded, villous at tip. Drupe globose or obovoid, 75 in. in diam., depressed at apex; pericarp crustaceous; cells 2; seed usually 1.

Johore: at Sungee Kaliang, Ridley 4031.—Distrib. Borneo (at Sandakan, Governor Creagh; Lowe; at Sarawak, Beccari 1111).

4. VITEX CLARKEANA, King & Gamble. A small shrubby tree, reaching about 15 ft. in height; branchlets pale brown, round, glabrous or puberulous. Leaves coriaceous, 1-foliolate; leaflet sessile, lanceolate or oblong-lanceolate, acuminate at apex, rounded at base; both surfaces glabrous, greyish when dry, the lower puncticulate; margins entire, recurved; 6 to 12 in. long, 2 to 3 in. broad; midrib stout, very prominently raised on the lower, slightly on the upper surface; main nerves 12 to 20 pairs, irregularly but slightly curving to near the margin, where they sharply bend parallel to it, all but the few lowest joining in an intramarginal looped nerve; secondary nerves few between the main nerves; reticulations irregular, not transverse and not prominent; petiole 5 to 75 in. long, jointed at the base of the leaflet. Panicle terminal, puberulous, 12 to 18 in. long; peduncle stout, angled, 2 to 4 in. long; main branches usually 3, elongate, the middle one usually longest, bearing distant opposite corymbose cymes of rather large flowers; the cymes 1 in. rarely 2 in. long; bracts small, caducous; bracteoles minute; pedicels about 1 to 2 in. long, much thickened in fruit; flowers pale blue, the lip darker. Calyx-tube campanulate, tawny-pubescent, ·125 to ·15 in. long, much enlarged in fruit; lobes 5 irregular, short, acute. Corolla-tube 25 in. long, pubescent without and at the insertion of the stamens within, 2-lipped; upper lip shortly 2-lobed, lobes recurved; lower lip 3-lobed, the midlobe twice as long as the recurved sides-lobes, constricted below, spreading above, crenate, Stamens exsert; filaments villous at base, thickened; anthercells elliptic. Ovary globose, depressed, tawny-pubescent; style slender, as long as stamens; stigma shortly 2-lobed. Drupe ovoid, 3 in. in diam. or longer, tawny-pubescent; seed apparently 1 only. V. simplicifolia, Clarke in Hook. f. Fl. Br. Ind. IV. 586 (1885).

DINDINGS: Pangkore Island, *Curtis* 1611. Perak: *Scortechini* 1383; at Telok Sera, *Ridley* 7990; in forest overlooking Bernam River, *King's Collector* 8788. Malacca: *Griffith* (K.D.) 6064. Johore:

Lake & Kelsall on Sembrong River, 4059.—DISTRIB. Borneo (Motley 1269; Beccari 166; Lobb, Haviland 1580).

The name of this plant has had to be changed, as that of *simplicifolia* was already occupied by *V. simplicifolia*, Oliv. in Trans. Linn. Soc. XXIX. 133, t. 130 (1875), a Central African plant collected by the Speke & Grant Expedition.

5. VITEX CORIACEA, Clarke in Hook. f. Fl. Br. Ind. IV. 586 (1885). A tree, reaching 60 ft. or more in height and 15 to 20 in. in diam.; branches slender with grevish-brown fissured bark; branchlets pale brown, obscurely quadrangular, striate, puberulous. Leaves coriaceous, 3-foliolate; leaflets petioluled, entire, lanceolate or oblanceolate, obtuse or acute at apex, long-attenuate at base; both surfaces glabrous, upper shining, lower dull, minutely glandular, prominently reticulate; 3 to 5 in. long, 1 to 2 in. broad, the midlobe only slightly longer than the others; midrib prominent; main nerves 6 to 7 pairs, curving upwards to and along the margin where they anastomose, joined by prominent but irregular netted reticulations all raised on the lower surface; petiole 1 to 2 in. long, puberulous, angular, the apex swollen, petiolule of mid-leaflet about 5 in. long, of the side ones about 25 in. Panicles terminal, strict, sessile, minutely fulvous-puberulous, reaching 6 to 8 in. in length and 3 to 4 in. in breadth; branches many, elongate, ascending, subquadrangular; the main peduncles often 3 in. long or more; the flowers in small often distant clusters; bracts small, linear; flowers violet or blue. Calyx funnel-shaped, fulvous-pubescent, enlarged and cup-like in fruit; tube 1 in. long; lobes 5, rounded, 05 in. long. Corolla 2-lipped; tube fulvous-pubescent without except at the base, as also within at the insertion of the stamens, 25 in. long; upper lip 2-lobed, lobes rounded, very pubescent, ciliate, 1 in. long; lower lip 3-lobed, midlobe ovate crenate, contracted at base, shaggy-villous within, 15 in. long, side lobes rounded, reflexed, 125 in. long. Stamens exsert; filaments thickened, pubescent; anthers curved so as nearly to meet at the tips. Ovary globose, only slightly glandular; style longer than filaments, pubescent; stigma bifid, the lobes reflexed. Drupe ellipsoid, very smooth, ·5 in. long, ·25 to ·35 in. broad, seated on the enlarged cup-shaped calyx; pericarp rather thin. Seed apparently 1 only.

KEDAH: lower slopes of Kedah Peak, Ridley 5555. PENANG: Government Hill, Curtis 323. PERAK: on Waterfall Hill, at 1000 ft., Wray 2225; Scortechini 2082; in hill forests, at 500 to 800 ft., King's Collector 4388, 4638, 7782, 8135. MALACCA: Griffith (K.D.) 6065,1; Maingay (K.D.) 1203; at Ayer Panas and Bukit Bruang, Derry 98, 1029. SINGAPORE: T. Anderson 183.

6. VITEX SIAMICA, Williams in Bull. Herb. Boiss. Ser. 2, V. 431 (1905). A tree with spreading branches, reaching 30 to 40 ft. in height and 15 to 20 in. in diam. of stem; branchlets rather slender, dark brown, glabrous, with prominent usually elongated lenticels. Leaves coriaceochartaceous; 3-foliolate, the leaflets all petiolulate, glabrous, entire; leaflets ovate or ovate-lanceolate, acuminate often bluntly at apex, rounded or cuneate at base, the side leaflets sometimes slightly asymmetric; the middle leaflet 2.5 to 5 in. long, .75 to 1.75 in. broad, the side ones usually about one-third smaller; midrib slender, raised beneath; main nerves 12 to 24 pairs, usually regularly spaced and parallel, only slightly curving to the margin and then anastomosing in an obscure looped marginal nerve, all raised beneath; secondary nerves and reticulations firmly netted; petiole 1 to 2 in. long, slender; petiolules about ·5 in. long, the middle one only slightly longer than the others. Panicles terminal, with sometimes additional branches from the axils of the upper leaves, minutely puberulous, sessile, many-flowered, reaching sometimes 12 in. in length; rachises very slender, puberulous, obscurely 4-angled; branches at first 3-chotomous, ultimately ending in slender dichasia; bracts many, conspicuous, persistent, linear-lanceolate, ·25 to ·75 in. long; bracteoles 2 to each pedicel, similar but slightly smaller; pedicels slender, sometimes 0; flowers small, pale blue or white. Calyx-tube campanulate, pubescent and with glandular dots without, 05 in. long; teeth 5, acute, 025 in. long; in fruit much enlarged, cup-shaped. Corolla small, 2-lipped; tube 1 in. long, pubescent on both sides except at the base, and with many yellow glands; upper lip with 2 short obtuse lobes, lower with 3 obtuse lobes, the middle lobe the longest and villous inside. Stamens included or very slightly exsert; filaments thickened, villous; anther-cells ellipsoid, parallel. Ovary rounded, depressed, sparsely glandular; style rather thick, as long as stamens; stigma shortly 2-fid. Drupe 15 in. in diam., globose, depressed at top, obscurely 4-lobed, glandular, black when dry; pyrene with thin putamen. Seeds usually 1 to 2, ovate, acute at base, flattened; testa thin. V. sympodiophora, P. Brühl MS. in Herb. Calc. V. lankavana, H. H. W. Pearson, MS. in Herb. Penang.

Kedah: at Coah, Langkawi Island, Curtis 1683; at Dayong Bonting, Langkawi, Fox 12720. Perak: on Batu Kurau top, Scortechini 1618; in open jungle on the top of limestone hills, at 400 to 1000 ft., King's Collector 7034, 8264. Selangor: top of rocks, Gua Batu, Ridley 8535.

Brühl's description, with drawings, in the Calcutta Herbarium, is most complete, and has been of great use, especially as perfect flowers are very few on the specimens available.

7. VITEX PUBESCENS, Vahl Symb. III. 85 (1794). A large tree, reaching a height of 50 to 60 ft. or more; bark ash-coloured, fissured; branchlets quadrangular, brown, lenticellate; innovations tawny-pubescent. Leaves chartaceo-coriaceous; digitately 3- to 5-foliolate, the middle leaflet always largest, the two next large, the basal pair when present much smaller; leaflets entire, sessile or subsessile, obovate or elliptic or broadly lanceolate, obtuse or acuminate at apex, rounded or cuneate at base; glabrescent on the upper surface except on the nerves, minutely pubescent on the lower surface; middle leaflet 6 to 8 in. long by about 3 in. broad, rest smaller in gradation; midrib stout; main nerves 12 to 20 pairs, regular, curving gently upwards and connected by prominent nearly parallel transverse nervelets; petiole 2 to 4 in. long, deeply channelled above; petiolules when present under 25 in. long. Panicles terminal, densely tawny-pubescent, pyramidal, usually sessile, reaching 10 in. in length and 6 to 8 in. in breadth; rachises sharply quadrangular; branch peduncles often 3 to 4 in. long; bracts many, conspicuous, persistent, ovate or spathulate, those of main nodes sometimes leaf-like; bracteoles similar to the bracts but smaller; pedicels none or very short; flowers blue or lilac. Calyx campanulate, thickly tomentose, ·15 to ·25 in. long; lobes 5 acute. Corolla 2-lipped, gibbous; tube broad, pubescent and glandular without except at the base, villous within at the insertion of the stamens, glabrous below it, about 25 in. long; upper lip 2-lobed, lower 3-lobed, the midlobe much the longest, villous within and concave at tip, the others rounded, reflexed. Stamens exsert; filaments broad and villous at the base; anther-cells elongate, connected only at tip. Ovary glabrous; style slender, longer than stamens; stigma shortly bifid. Drupe black, globose, 2 to 3 in. long, depressed at top, faintly ribbed, 4-celled. Schauer in DC. Prodr. XI. 685; Blume Bijdr. 812; Done. in Nouv. Ann. Mus. d'Hist. Nat. III. 401; Bedd. Fl. Sylv. XXI.; Kurz For. Fl. II. 271; Miq. Fl. Ind. Bat. II. 861; Clarke in Hook. f. Fl. Br. Ind. IV. 585; Koord. & Val. Bijdr. VII. 202; Prain Beng. Plants 833. V. arborea, Roxb. Hort. Beng. 46, and Fl. Ind. III. 73; Jack in Mal. Misc. I. 18, and in Hook. Bot. Misc. I. 285; Wall. Cat. 1747; Wight Ic. t. 1465. V. inæquifolia, Turcz. in Bull. Soc. Imp. Nat. Mosc. II. 223.

Penang: Wallich 1747 part; J. Scott; Curtis 64. Perak: at Thaipeng, Wray 139; King's Collector 267; Scortechini 77, 99, 916. Malacca: Griffith; Maingay (K.D.) 1204; Derry. Singapore: Wallick 1747 part; Schomburgk 48; Cantley 17; Ridley.—Distrib. India, Burma, Malay Archipelago.

8. VITEX HETEROPHYLLA, Roxb. Hort Beng. 46 (1814), and Fl. Ind. III. 75 (1832). A large tree, reaching 80 ft. in height and 3 ft. in diam.

of stem; branchlets quadrangular, dark grev, lenticellate, glanddotted. Leaves chartaceous: 5-foliolate, the middle leaflet longest. the next pair not much smaller, the lowest pair sometimes nearly as long, sometimes reduced, all petiolulate or the lowest sometimes subsessile: leaflets entire, variable, elliptic or elliptic-oblong or -ovate or -obovate, often long-cuspidate-acuminate at apex, attenuate or somewhat rounded at base, the side leaflets usually unequally; both surfaces glabrous, dark reddish-brown when dry, the upper with white, the lower with vellow glands; middle leaflet 5 to 7 in. long, 3 to 4 in. broad. the rest smaller in proportion; midrib stout, slightly impressed above. raised beneath; main nerves 7 to 10 pairs curving upwards to and along the margin and joined by fairly regular and prominent transverse nervules; petiole 3 to 6 in. long, terete below and flattened above; petiolule of middle leaflet 5 to 1 in. long, of next pair about 5 in., of the lowest pair 0 to 25 in. long. Panicles terminal, the lowest nodes often leafy, thinly cinereous-tomentose, usually sessile, thyrsoid, reaching 12 in, in length and 8 in, in diam.: branches opposite, elongate, quadrangular, bearing interrupted pairs of cymules usually .5 to .75 in, long: bracts 0 or very small; pedicels very short; flowers pale vellow with a blue lip. Calyx tubular campanulate, grey-pubescent and glandular. ·1 in, long, enlarged and broadened and ribbed in fruit; teeth 5, small. acute. Corolla-tube broadly funnel-shaped, pubescent and dotted with yellow glands without, glabrous within except a row of villous hairs within below the insertion of the stamens; 2-lipped, the upper lip of 2 recurved acute lobes 1 in. long, the lower of 3 lobes, the side ones recurved, obtuse, 1 in. long, the middle one oblong, 15 in. long, villous on the throat. Stamens exserted, curved; filaments glabrous; anthercells oblong, at first curved downwards, afterwards divaricate. Ovary rounded, glabrous except a few glandular dots; style slender, thickened above: stigma shortly 2-lobed. Drupe pyriform, depressed at top, sparsely glandular, blackish-grey and wrinkled when dry; pyrene very hard, ribbed, hollowed at base. Seeds oblong, flattened, 2 in. long. ·075 in. broad; testa thin, spongy; cotyledons oblong, ·1 in. long; radicle ·04 in. long. Wall. Pl. As. Rar. 15, t. 226, and Cat. 1745; Schauer in DC. Prodr. XI. 686 partly; Clarke in Hook. f. Fl. Br. Ind. IV. 585; Prain Beng. Plants 833.

PERAK: at Tapa, Wray 197; in hill forests up to 1000 ft., King's Collector 6034, 7530, 10063, 10377.—DISTRIB. India (Sikkim, Assam and East Bengal).

9. VITEX SUMATRANA, Miq. Fl. Ind. Bat. Suppl. 567 (1860).

 V_{AR} . urceolata, King & Gamble. A tree, reaching 40 to 60 ft. in height and 2 ft. in diam. of stem; branchlets quadrangular, channelled

at the sides from raised lines descending from the sides of the petiole, glabrous or very slightly puberulous. Leaves chartaceous, 3- to 5-foliolate, the middle leaflet longest, the next pair not much smaller, the lowest pair a good deal smaller, all petiolulate or the lowest pair subsessile; leaflets entire, obovate or oblong-obovate, shortly suddenly acuminate at apex, rounded often unequally at base; upper surface glabrous, except on the nerves, olivaceous-brown, shining, rough, minutely white-glanddotted; lower surface glabrous, paler than the upper, with minute yellow glands; middle leaflet 4 to 6 in. long, 2.5 to 3 in. broad, rest gradually smaller but similar; midrib strong, impressed above; main nerves about 10 pairs, irregular, curving upwards to and along the margin and joined by rather irregular transverse nervules; petiole 1.5 to 4 in. long, quadrangular but not winged; petiolule of middle leaflet about 1 in. long, of next pair about 5 in. long, of the lowest pair 0 to 25 in. long. Panicles terminal, thinly cinereous-tomentose, thyrsoid, usually sessile, reaching 8 in. in length and 5 in. in diam.; branches elongate, cylindric, bearing interrupted whorls of pairs of many-flowered cymules about 5 in. long; branch-peduncles 1 to 2 in. long; bracts linear 1 to ·15 in. long, recurved, deciduous; buds large, reaching ·25 in. long. Calyx tubular-campanulate, 15 in. long, flattened in fruit and enlarged; tube tawny-pubescent and glandular without, glabrous within; teeth short, acute, rounded in fruit. Corolla-tube curved, contracted at the throat, 25 in. long, pubescent without except at the base, quite glabrous within; 2-lipped, upper lip of 2 erect crenate lobes 1 in. long, lower of 3 lobes, midlobe broad, crenate, obtuse, 2 in. long, side lobes shorter, reflexed, all pubescent without, glabrous within. Stamens curved, exsert; filaments glabrous; anther-cells attached only at one point, curving to nearly erect. Ovary conical, with a few glands on its top; style thickened, sigmoid below, glabrous; stigma shortly 2-lobed. Drupe globose, depressed, 3 to 5 in. long, shortly apiculate, wrinkled when dry; pyrene very hard. Seeds flattened, oblong; testa thin, spongy. V. urceolata, Clarke in Hook. f. Fl. Br. Ind. IV. 585 (1885). V. heterophylla, Schauer in DC. Prodr. XI. 686 partly. V. Loureirii, Herb. Wight, not of Hook. & Arn.

Perak: in Upper Perak, at 300 ft., Wray 3653; Scortechini 61; in dense mixed jungle, at 400 to 600 ft., King's Collector 10406. Malacca: Griffith (K.D.) 6064; Maingay (K.D.) 1205, 1207.

As pointed out by Clarke, this variety differs in the glabrescent foliage, larger flowers and larger drupes. V. heterophylla, Roxb., with which Koorders & Valeton would combine V. urceolata, has different leaves and inflorescence and a corolla villous within.

10. VITEX PTEROPODA, Mig. Fl. Ind. Bat. Suppl. 567 (1862). A tree. reaching 40 to 60 ft. in height and a considerable diameter of stem; branchlets stout, pale brown, obscurely quadrangular. Leaves coriaceous: 5- to 7-foliolate, only the lowest pair much smaller than the others; petiole prominently and very broadly winged; leaflets long, lanceolate or oblong-lanceolate or oblanceolate, acuminate at apex, cuneate at base; both surfaces glabrous, minutely dotted and so scabrid to the touch; margins recurved; 4 to 20 in, long, 1 to 2.5 in. broad; midrib stout; main nerves 12 to 16 pairs, prominent on the lower surface, at first somewhat straight and then curving to and along the margin till they meet, joined by prominent transverse nervules and reticulations; petiole 4 to 7 in. long, broadly winged, the wings broadest (1 to 1.5 in. on either side) at a short distance from the base, sometimes narrowed only near the top, sometimes earlier and then curving upwards, often cordate or auricled at both ends; petiolules 5 to 1 in. long, bordered by the decurrent margins of the leaflet blades. Panicles terminal or partly axillary to uppermost leaves, subsessile, glabrous, reaching 1 ft. in length and about 8 in. in diam.; rachises slender, angular, striate or channelled; peduncles of all classes, primary secondary and tertiary, long, ending in few sparse few-flowered short cymules scarcely 25 in. long; bracts linear, acuminate, 1 to 15 in. long, persistent; bracteoles under the calvx similar but shorter; pedicels 0 or very short; flowers white with a pink tinge. Calyx urceolate, glabrous. 1 in. long: teeth 5, acute. Corolla-tube short, 075 to 1 in. long, puberulous without, glabrous or very slightly villous within near the base; lobes short, obtuse. Stamens scarcely exsert; filaments villous: anther-cells ellipsoid, nearly parallel. Ovary globose, much depressed, glabrous; style slender; stigma shortly 2-forked. Drupe ovoid-oblong, .75 to 1 in. long, .5 in. in diam., smooth, seated on the spreading, much enlarged calyx; pericarp very thick; seed 1.

Perak: Scortechini; in dense jungle or low ground near Larút, King's Collector 5249, 6668.—Distrib. Sumatra (Teysmann).

It is unfortunate that we could only find, in all the specimens available, one broken and imperfect corolla. The tree is a remarkable one, and is clearly very nearly allied to $V.\ per-alata$, King, but differs in the long narrow leaflets with scabrid points, the glabrous, usually terminal, sparsely flowered panicles, short corolla-tube and smaller drupes. The broad wings to the petioles are much the same in both. The specimen of Teysmann's at Kew consists only of a couple of leaflets about 20 in. long.

11. VITEX PER-ALATA, King MS. in Herb. Calc., Kew Bull. 112 (1908). A spreading tree, reaching 80 ft. in height and 2 ft. in diam. of stem; branchlets very thick, angular, striate, dark brown. Leaves

coriaceous; 5- to 7-foliolate, only the lowest pair much smaller than the others; petiole prominently and very broadly winged; leaflets elliptic or elliptic-oboyate, acute at apex, long-attenuate at base; both surfaces glabrous; margins recurved; middle lobe 6 to 20 in. long, 3 to 6 in. broad, the rest smaller in proportion; midrib stout, impressed above, raised beneath; main nerves 10 to 14 pairs, prominently raised beneath, curving upwards to and along the margin, joined by a conspicuous (on upper surface) network of reticulations; petiole 3 to 6 in. long, the wings broad below and almost cordate, the breadth (the broadest at 1 to 2 in. above the base) reaching 1.5 to 2 in. on either side at widest, curving upwards rather abruptly or gradually to the top, and veined like the leaves; petiolules often 0, when present scarcely reaching 25 in. long. Panicles terminal or sometimes axillary to the uppermost leaves, sessile or peduncled, puberulous, reaching 2 ft. in length and about 1 ft. in diam.; rachises angular, channelled; peduncles up to 8 in. long, very stout, somewhat flattened; secondary peduncles of branches in whorls of 4 around the main rachis, up to 5 in. long; flowers in short opposite or alternate many-flowered cymules, about 5 in. long, along the branches; bracts linear-lanceolate, 1 to 2 in. long, persistent; pedicels 0 or very short; flowers light blue with brown markings. Calyx pink, shortly urceolate, tawny-pubescent, 1 to 15 in. long; teeth short, acute, in fruit slightly enlarged and recurved. Corolla-tube campanulate, 25 in. long, pubescent without, villous within around the point of insertion of the stamens and up to the midlobe of the lower lip; upper lip of 2 ovate acute lobes 1 in. long, the lobes reflexed; lower lip of 3 lobes, side lobes oblong, rounded, 15 in. long, reflexed; midlobe broad, obtuse, 2 in. long, all puberulous. Stamens exsert; filaments flattened at base, villous hairy; anther-cells ellipsoid, rather short, slightly divaricate. Ovary rounded, depressed, villous at top, glabrous below; style slender, slightly longer than the stamens; stigma shortly 2-forked. Drupe ovoid-conoidal, smooth, longitudinally ribbed, 1.5 in. long by 1 to 1.25 in. broad; pericarp very thick; pyrene with rather soft shell. Seed 1; testa membranous; cotyledons orbicular, flat.

Perak: at Simpang, Wray 2029, 2254, 2305; in dense jungle on low wet ground near Larút, King's Collector 2064, 6187, 6874, 8299.

This must be a splendid tree and worthy of cultivation for ornamental purposes. The large fruit, resembling that of the walnut, and the broad wings to the leaf-petioles are very characteristic.

12. VITEX GLABRATA, Br. Prodr. Fl. Nov. Holl. 512 (1810). A large tree; branchlets pale brown, obscurely quadrangular; innovations

fulvous-tomentose. Leaves chartaceous; digitately 3- to 5-foliolate, the lowest pair rather smaller than the others, the middle leaflet slightly larger; leaflets entire, petiolulate, obovate elliptic or elliptic-oblanceolate, acuminate at apex often obtusely, attenuate or cuneate at base; both surfaces grey-pubescent when young, afterwards glabrate or with scattered appressed hairs and a few glands beneath, the nerves beneath pubescent and with tufts of hair in the axils; 2 to 6 in. long, 1.5 to 2.5 in. broad; midrib slender, impressed above, raised beneath; main nerves 10 to 20 pairs, regular, slender, the uppermost ones obscure, slightly curved to the margin; transverse nervules and reticulations obscure; petiole 3 to 6 in. long, angular, channelled above; end petiolules .75 to 1 in. long, rest .25 to .5 in. long, angled and channelled. Cymes axillary, corymbose, peduncled, puberulous, reaching 4 to 5 in. in length and 2 to 3 in. in diam.; peduncles slender, angular, up to 2 in. long; branches markedly dichotomous, spreading; bracts linear, pubescent, caducous; pedicels slender, 0 to 1 in. long; flowers white, the lip blue-purple. Calyx campanulate, 05 to 1 in. long, pubescent without, enlarged in fruit; teeth 5, very short, acute. Corolla-tube broadly cylindric, 2 in. long, pubescent without, glabrous within except a ring of villous hairs at the insertion of the stamens, the hairs extending up the midlobe of the lower lip; upper lip with 2 obtuse recurved lobes 15 in. long; lower lip 3-lobed, the side lobes recurved, 15 in. long, the midlobe spreading, 25 in. long, densely villous. Stamens much exsert; filaments villous; anther-cells short, ellipsoid, divaricate. Ovary globose, pubescent at top; style slender, as long as stamens; stigma spreading. Drupe ovoid or obovoid, succulent, 3 to 5 in. in diam., smooth. Schauer in DC. Prodr. XI. 695; Benth. Fl. Austral. V. 68; Clarke in Hook. f. Fl. Br. Ind. IV. 588; Koord. & Val. Bijdr. VII. 208; Prain Beng. Plants 833. V. Cunninghami, Schauer l. c. 691. V. leucoxylon, Schauer l. c. 692 in part; Kurz For. Fl. II. 273; Mig. Fl. Ind. Bat. II. 864, not of Linn. f. V. bombacifolia, Wall. Cat. 1749; Walp. Rep. IV. 86. V. pallida, Wall. Cat. 1751.

Kedah: in dense jungle near sea-level, Kunstler 1763. Penang: Curtis 1071.—Distrib. India (Assam to Chittagong), Burma, Java, Siam, Cochin China, North Australia and Queensland.

13. VITEX LONGISEPALA, King & Gamble in Kew Bull. 112 (1908). A small or moderate-sized tree; branchlets rather stout, obscurely quadrangular, softly tawny-pubescent as are the innovations. Leaves membranous; trifoliolate, the middle leaflet largest and petiolulate, the side ones subsessile; leaflets ovate or elliptic-ovate, abruptly caudate-acuminate at apex, the middle leaflet acuminate or cuneate at base, the

side ones cordate or rounded or acute and unequal; the upper surface sparsely hispid and gland-dotted, the lower tawny-pubescent, villous on the nerves and gland-dotted; margins entire; 4 to 12 in. long, 2 to 6 in. broad; midrib stout; main nerves 8 to 15 pairs, curving outwards to and along the margin and joined by many transverse nervules and reticulations; petiole 2 to 6 in. long, densely tawny-pubescent; petiolule of middle leaflet 25 to 2 in. long, of side leaflets none or under ·5 in. long. Cymes axillary, opposite, tawny-pubescent, 1 to 2·5 in. long; main peduncles usually 2, vertically arranged, 1 to 1.5 in. long; branches 2- to 3-chotomous, spreading, corymbose; bracts conspicuous, narrowly lanceolate, 25 to 75 in. long, persistent; pedicels about 1 in. long; flowers primrose-vellow. Calux villous, with golden brown hairs; tube campanulate, 1 in. long; lobes 5 subequal, oblong-lanceolate, 25 in. long, conspicuous. Corolla-tube slender, funnel-shaped, ·4 to ·5 in. long, prominently dotted with yellow glands; 2-lipped with a scanty ring of hairs within at the insertion of the stamens, 15 in. above the base of; upper lip shortly 2-lobed, the lobes rounded; lower lip 3-lobed, side lobes reflexed, middle lobe narrowed below, broadened above and fimbriate, twice as long as side lobes. Stamens exsert: filaments glabrous, slender; anther-cells elongate, narrow, parallel. Ovary conoidal on a cylindric base, the top densely yellow-glandular; style slender; stigma bifid. Drupe ovoid, black, smooth, gland-dotted, ·3 in. long; pyrene hard, reticulately ridged, with 3 to 4 fertile cells near the top and a large cavity below. Seeds obovoid, slightly flattened, .075 in. long; testa thin.

Penang: at Batu Kawan, Curtis 395. Perak: at Bujong Malacca, Ridley 9723; at Tapa, Wray 1319; at Waterloo, Curtis; Scortechini 100, 113, 340; in open jungle, Goping, King's Collector 460. Selangor: Ridley 7595; at Rawang, Goodenough 10488.

This species is very near indeed to *V. vestita*, but differs in the much larger leaves and the prominent large bracts and calyx-lobes.

14. VITEX VESTITA, Wall. Cat. 1750 (1828). A moderate-sized tree; branchlets rather slender, obscurely quadrangular, softly grey-tawny-pubescent as are innovations. Leaves membranous; trifoliolate, all three leaflets petioluled, the mid-leaflet much the largest; leaflets elliptic or elliptic-lanceolate, long-acuminate at apex, the middle leaflet equally acuminate at base, the side ones rounded or acute with more or less unequal sides; the upper surface sparsely hispid and gland-dotted, the lower softly tawny-pubescent, villous on the nerves, also yellow-gland-dotted; margins entire; 3 to 7 in. long, 1.5 to 4 in. broad; midrib stout; main nerves 8 to 10 pairs, curving upwards to

and along the margin and joined by prominent rather irregular nervules and reticulations; petiole usually slender, 2 to 3 in. long, petiolule of middle leaflet 1 to 1.5 in. long, of side leaflets .25 to .5 in. long. Cymes axillary, opposite, sessile, tawny-pubescent, 1 to 1.5 in. long, 2- to 3-chotomous; main peduncles usually 2, sometimes more, one above the other vertically, 25 to 5 in. long; branches 2- to 3-chotomous, corymbose, spreading; bracts minute, linear, caducous; pedicels slender, 0 to 1 in. long; flowers yellow (Kunstler). Calyx campanulate. densely pubescent and gland-dotted without, 1 to 15 in. long, subtruncate or 2-lipped, enlarged and saucer-shaped in fruit; lobes acute, short. Corolla-tube slender, 2-lipped, narrow, cylindric, 4 to 5 in. long, glabrate without and with large yellow glands, glabrous within except for a villous ring about 1 in. above the base and as far below the insertion of the stamens; upper lip shortly 2-lobed, lower 3-lobed, the midlobe slender, hardly longer than the others. Stamens included; filaments glabrous; anther-cells elongate, narrow, curved downwards, each ending in an oblong empty appendage about half as long as the cell. Ovary densely covered with yellow glands, oblong, obtuse; style slender. Drupe oblong, 3 to 4 in. long and 25 in. broad, sparsely gland-dotted; pyrene hard, reticulately ridged, with 3 to 4 fertile cells near the top and a large empty cavity below. Seeds obovoid, flattened, acute at base, 06 in. long; testa thin; cotyledons elliptic, fleshy; radicle small. Schauer in DC. Prodr. XI. 692; Mig. Fl. Ind. Bat. II. 864; Kurz For. Fl. II. 272; Clarke in Hook. f. Fl. Br. Ind. IV. 587. V. Finlaysoniana, Wall. Cat. 6314.

Penang: Wallich 1750 b, G. King; at Penara Bukit, Curtis 265. Perak: on Maxwell's Hill, Wray 699; Kunstler 176. Selangor: at Bukit Kutu, Goodenough 10547. Malacca: Griffith (K.D.) 6063; Cuming 2351; Derry 656, 899. Johore: at Jaffaria, G. King. Singapore: at Sungei Jeeroo, Ridley 3867; at Chenchukang, Goodenough 2792.—Distrib. Burma, Wallich 1750a; Sumatra, Borneo.

15. VITEX GAMOSEPALA, Griff. Notul. IV. 178, and Ic. Pl. Asiat. t. 448, fig. 2 (1854). A slender moderate-sized tree; branchlets dark brown, prominently lenticellate, innovations fulvous-hairy. Leaves chartaceous; trifoliolate, all three leaflets petiolulate, the mid-leaflet somewhat the largest; leaflets entire, ovate or lanceolate, long-acuminate at apex, the side leaflets acute and slightly unequal at base, the mid-leaflet acuminate; both surfaces glabrate except on the nerves beneath, the lower glandular, brown when dry, the upper olivaceous; 3 to 7 in. long, 1.5 to 2.5 in. broad; midrib stout, raised beneath; main nerves 5 to 7 pairs, curving acutely upwards to and along the margin where they meet, joined by an irregular network of nervules, prominently

raised beneath when dry; petiole slender, terete, 2 to 4 in. long; petiolule of mid-leaflet '75 to 1 in. long, of side leaflets '25 in. long. Cymes axillary, sessile, corymbose, sparingly fulvous-hairy, 2-chotomous below, 3-chotomous above, reaching 1.5 in. long or more; bracts short, linear, caducous; pedicels slender, 0 to 1 in. long; flowers pale yellow. Calux 2-lipped; tube ovoid, 1 in. long, densely glandular without as are the lobes; upper lip entire, oblong, 275 in. long; lower lip 2-lobed, .075 in. long, the lobes rounded; in fruit split on one side to the base and enlarged to a beaked shallow cup. Corolla funnel-shaped; tube ·35 in. long, with a ring of hairs within near the base; upper lip entire or shortly 2-lobed, lower 3-lobed, the middle lobe 125 in. long, 2-fid, the side lobes .06 to .1 in. long; tube and lobes, except the ends of the middle lobe of the lower lip which are usually incurved, all covered with prominent large shining yellow glands. Stamens exsert; anthers sparsely pilose near the base; cells elongate, parallel, each with a short empty beak. Ovary conical, densely glandular; style slender, glabrous; stigma shortly 2-lobed. Drupe obovoid, black, slightly glandular, fleshy, 3 in. long, 25 in. in diam.; pyrene very hard, reticulately ridged, hollow at the base, the 3 to 4 cells near the top bearing seeds. Seeds oblong, beaked below, 05 in. long; testa thin; cotyledons fleshy, convex, elliptic; radicle minute. Benth. in Gen. Pl. II. 1154; Clarke in Hook, f. Fl. Br. Ind. IV. 588.

PERAK: at Larút, Scortechini 445, 1480; in dense forest near Larút, at 500 to 1000 ft. alt., Kunstler (King's Collector) 1841. Selangor: at Kwala Lumpur and on Pahang road, Ridley 8546, 10218, 10479; Curtis 2366. Malacca: at Chin Rhingull, Griffith (K.D.) 6065; Maingay (K.D.) 1202. Singapore: at Changi, Ridley 2788.

As pointed out by Clarke, this species in its inflorescence and corolla, and, it may be added, in its fruit, shows a great affinity to *V. vestita*. But the calyx distinguishes it at once, and the leaves differ a good deal. Griffith's fig. represents the anthers only.

VAR. Scortechinii, King & Gamble. Cymes shorter and few-flowered. Calyx much shorter, the upper lip only .075 in. long, the lower .025 in. with more acute lobes. Corolla similar, but middle lobe of lower lip entire and yellow glands much fewer and less prominent.

PERAK: Scortechini; at Bujong Malacca, Ridley 9725; at Tapa Batang Padang, Wray 180; at lower camp, Gunong Batu Pateh, 3400 ft., Wray 992, 1080. NEGRI SEMBILAN: at Seremban, Ridley 10096.— DISTRIB. Sumatra (Forbes 3060).

Var. Kunstleri, King & Gamble. Leaflets ovate, acuminate at apex and base, 2 to 3 in. long, 1 to 1.5 in. broad; petiole 1 to 2 in. long; petiolule of end leaflet 5 in., of side leaflets 25 in. long. Calyx 2-lipped;

short, 1 in. long; upper lip 075 in. long, acute or rounded, often 2-lobed; lower lip acutely 2-lobed, the lobes 05 in. long. *Corolla-tube* slender, 45 in. long, very glandular; upper lip shortly 2-lobed; lower lip 3-lobed, side lobes short, narrow, midlobe longer, obtuse. *Anthercells* with a short rounded beak. Otherwise as in type.

Perak: at Ulu Bubong, in open jungle at 400 to 600 ft., King's Collector 10605. Tringganu: at Bunda, Rostado (Herb. Ridley 11982).

—Distrib. Sumatra (Forbes 2685).

This is a well-marked variety, but is not quite deserving of specific rank.

Tribe III. CARYOPTERIDEÆ.

11. PERONEMA, Jack.

A small tree; branchlets grey-tomentose. Leaves opposite, imparipinnate; leaflets sub-opposite, in several pairs, entire. Inflorescence of large compound, spreading, terminal, trichotomous panicles of corymbose cymes; flowers very small; bracts small, setaceous. Calyx campanulate, 5-partite, not accrescent. Corolla-tube short; limb 2-lipped, 5-lobed, the midlobe of the lower lip longer than the rest. Stamens 2, involute in bud, exsert; anthers broadly ovate-reniform with parallel cells. Ovary 4-celled, the cells 1-ovuled; style filiform; stigma entire or bifid; ovules attached laterally near the top of the placenta. Fruit a small globose capsule of 4 crustaceous valves, the valves separating from the base together with the adjoining portions of the central placenta. Seeds attached centrally near their top, pendulous, exalbuminous; testa thin, as are the cotyledons; radicle minute.—Distrib. One species, Malayan.

Peronema canescens, Jack in Mal. Misc. II. No. 7, 46 (1822). A small tree; bark grey; branchlets stout, grey, obtusely quadrangular; pith quadrangular. Leaves chartaceous, reaching 1 to 2 ft. in length; pinnules 7 to 9 pairs, the upper pairs usually opposite, the lower subopposite or nearly alternate; the rachis winged, the wings narrow, from .05 to .25 in. broad; petiole 2 to 7 in. long; leaflets sessile, lanceolate, acuminate at apex, cuneate at base, gradually increasing in size upwards, from 1 in. by .5 in. at the base to as much as 9 in. by 2.5 in. at the tip; upper surface glabrous, lower puberulous, tawny-canescent; margins entire or serrate; midrib prominent; main nerves 20 to 30 pairs, regular, straight, joined by loops near the margin; reticulations netted. Panicle reaching 12 in. in length and about 20 in. in breadth, tawny-puberulous; peduncle stout; rachis quadrangular; lower branches opposite, long- (4 to 5 in.) peduncled, ending, as the upper ones, in corymbose, many-flowered cymes; bracts scarcely .2 in. long,

bracteoles very small, numerous; pedicels slender, very short; buds globose; flowers white. Calyx·1 in. long; lobes acute, glabrous within. Corolla glabrous within, pubescent without; lower midlobe·15 in. long, the rest·1 in. Stamens deflexed; filaments thickened towards the base. Ovary villous, as is the base of the style. Capsule densely tawny-pubescent, 125 in. broad, 1 in. long. Hook. Comp. Bot. Mag. I. 152; Wall. Cat. 9075; Schauer in DC. Prodr. XI. 627; Wight Ic. t. 1460; Griff. Notul. IV. 177; Miq. Fl. Ind. Bat. II. 909; Clarke in Hook. f. Fl. Br. Ind. IV. 599; Koord. & Val. Bijdr. VII. 214. P. heterophyllum, Miq. Fl. Ind. Bat. Suppl. 570.

Penang: Racecourse, Curtis 2427. Perak: at Ijuk, Scortechini 1160. Malacca: Griffith (K.D.) 6015. Pahang: Ridley 2247. Singapore: at Bukit Mandai, Ridley 3993.—Distrib. Sumatra (Teysmann, Forbes 2655), Java, Borneo (Motley 870).

12. Petræovitex, Oliver.

Shrubs, usually climbing. Leaves opposite, simple or 3-foliolate or bipinnate, petiolate. Inflorescence of terminal or axillary paniculate cymes with puberulous spreading branches; bracts subulate; flowers very small, shortly pedicellate. Calyx short, campanulate, much accrescent after flowering, the tube then long, and the lobes converted into oblanceolate scarious reticulate wings. Corolla oblique, 2-lipped; the lobes obtuse, incurved at the tip. Stamens 4, subequal or didynamous; exsert or included; anthers oblong; cells parallel. Ovary obovoid, imperfectly 2-celled, cells 2-ovuled; ovules pendulous; style slender; stigma bifid. Fruit capsular, oblong or wedge-shaped; exocarp thin. Seeds 2 (or 1 by suppression), attached to the central placenta; testa membranous; albumen none; cotyledons oblong or obovate, emarginate, fleshy; radicle thick, inferior.—Distrib. About 3 species, native of the Malay Peninsula and Archipelago.

Tawny-pubescent; leaves 3-foliolate, leaflets under 3 in. long; capsule prominently ribbed 1. P. Scortechinii.

Glabrous or very slightly puberulous; leaves 1 to 3-foliolate, leaflets over 3 in. long; capsule not ribbed . . . 2. P. bambusetorum.

1. Petræovitex Scortechini, King & Gamble in Kew Bull. 113 (1908). A shrub, perhap sclimbing; branchlets pale brown, somewhat angular, puberulous; innovations tawny-pubescent. Leaves opposite, membranous, trifoliolate; end leaflet ovate, shortly and obtusely acute at apex, rounded or slightly cuneate at base; 2 to 3 in. long, 1 to 2 in. broad; upper surface minutely pubescent, lower grey-pubescent; margins entire or undulate, main nerves 4 pairs, curving sharply upwards; side

leaflets similar but rather smaller and usually somewhat unequally cordate at base; petiole 1.5 to 2 in. long; petiolule of end leaflet 5 to .75 in. long, of side leaflets 25 in. long, all pubescent. Cymes in axillary, tawny-pubescent, 3- or 2-branching panicles up to 6 in. long, the uppermost very short and few-flowered; bracts leafy, nearly orbicular, 5 to ·75 in. in diam., pale; pedicels short. Calyx deeply-cleft, tawny-pubescent; lobes 5 or 4, oblong or spathulate, 25 in. long; fruiting calyx much enlarged; the tube 25 in. long, enclosing the fruit; the 5 or 4 lobes expanded into elliptic oblong shining scarious lobes 75 to 1 in. long, having 3 to 5 longitudinal nerves and prominent netted reticulation. Corolla very small (buds only available), 2-lipped; lobes spathulate, concave, 1 to 15 in. long. Stamens 4 exsert, 2 lower longer than the 2 upper; filaments short; anther-cells of upper pair parallel, of lower slightly divaricate. Ovary cylindric, villous, obtuse at top, 2-celled: style short; stigma 2-lobed, the lobes spreading. Fruit capsular. oblong or wedge-shaped, obtuse and pubescent at tip, 2 to 25 in. long: exocarp chartaceous, striate. Seeds 2 (or 1 by suppression); cotyledons obovate, obliquely obtuse, emarginate, 15 in. long, 1 in. broad.

PERAK: Scortechini 753 (or 1753?).

2. Petræovitex bambusetorum, King & Gamble in Kew Bull. 113 (1908). A creeper reaching 30 to 50 ft. long and 2 to 3 in. in diam. (King's Collector); branches smooth, pale brown. Leaves opposite. chartaceous, 1- or 3-foliolate; leaflets ovate, acuminate at apex, rounded or slightly cuneate at base; 3 to 4 in. long, 1.5 to 2.5 in. broad; both surfaces glabrous; margins entire; main nerves about 8 pairs, straight to join a looped intramarginal nerve rather far from the edge; reticulations netted, raised, prominent beneath; petiole 1 to 2 in. long: petiolules .25 to .5 in. long, slender, the end one slightly the longest. Cymes in sessile or peduncled, thyrsoid, axillary, glabrous or puberulous panicles reaching 4 to 5 in. long and about 3 in. broad; rachis angular, very slender as are the branches and pedicels; bracts leafy, lanceolate, long-acuminate; bracteoles minute, setaceous; pedicels very short; Calyx in bud very small, scarcely 05 in. long, with triangular acute teeth; gradually enlarging later until in fruit it has a tube 25 to 35 in. long and strongly ribbed, with oblong-spathulate, membranous, shining lobes 4 to 5 in. long and 1 to 15 in. broad; the lobes prominently 3-nerved and reticulate. Corolla very small (buds only available), 2-lipped, the upper lip slightly 2-lobed, the lower deeply 3-lobed, all very small and glabrous. Stamens 4, subequal; filaments stout; anthers oblong with parallel cells. Ovary rounded; style short; stigma 2-lobed. Fruit capsular, wedge-shaped, slightly convex above, 3 in. long; exocarp thin pubescent, not ribbed. Seeds 2 (or 1 by suppression); testa membranous; cotyledons obovate, truncate and slightly emarginate.

Perak: in dense bamboo forests, at 500 to 700 ft., near Ula Kerling, King's Collector 8765.—Distrib. Borneo (Haviland 1913; Ridley 9065).

The Perak specimens are rather poor ones, with flowers in bud and very young fruit, and they have 3-foliolate leaves, while the Borneo specimen is unifoliolate and in fruit; so that it is not quite certain that they belong to the same species, but after very careful examination we believe that they do, as the leaflets are identical and so are the nerves of the fruiting calyx.

The genus *Petræovitex* was founded by Prof. D. Oliver on *P. Riedelii*, Oliv., in Hook. f. Ic. Pl. V. 15. t. 1420 (1883), a plant sent from the Island of Buru by Mr. Riedel, and remarkable for its bipinnate leaves.

Tribe IV. Symphoremeæ.

13. SPHENODESME, Jack.

Leaves opposite, entire. Inflorescence of capi-Climbing shrubs. tate, 3- or 7-flowered, centrifugal cymes enclosed in an involucre of 6 foliaceous accrescent bracts, the cymes in pairs on the branches of large terminal or axillary, leafy, thyrsoid panicles. Calyx ovoid-campanulate, usually enlarging after flowering; lobes of 5 rather short teeth. Corolla sub-regular; tube short, cylindric; lobes 5, rarely 6, subequal, imbricate in bud. Stamens 5, inserted in the tube of the corolla below the throat, included or exsert; anthers small, oblong or reniform, the cells parallel or divergent. Ovary 2-celled, the cells 2-ovuled; ovules pendulous from the apex of the placentiferous axis; style filiform, short or long; stigma 2-lobed. Drupe globose or obovoid, included in the calvx, 1-seeded or rarely 2-seeded; exocarp leathery. Seed globose, entirely filling the cavity or its lower part; the placentas included within the cotyledons; testa membranous; cotyledons thick, very fleshy; radicle very small, inferior.—DISTRIB. About 10 species, in India, Malaya and the Malay Archipelago.

Corolla-lobes long, narrow; style very short; anthers included in				
the corolla-tube (Sect. 1. Brachynema, Griff.)	1.	s.	ferruginea.	
Corolla-lobes ovate or oblong, broad; style long, exsert; anthers	.			
exsert (Sect. 2. Eusphenodesma, C. B. Clarke):-				
Flower-heads 3-flowered, the 6 bracts small in flower, enlarged in				
fruit; branchlets and leaves glabrous or nearly so	2.	S.	triflora.	
Flower-heads 7-flowered, the 6 bracts enlarged both at flowering-				
time and in fruit:—				
Branchlets, leaves and inflorescence rufous-hirsute; calyx				
very hirsute	3.	S.	barbata.	
Branchlets, leaves and inflorescence sparingly pubescent or				
[10] 하는 그는 그를 가장하는 하다는 사람은 사람이 하면 되어 있다면 되어 있다면 되어 가장 생각이다. 그 생각이 나를 가장 살고 가지 않는 것 같다.		s.	pentandra.	

1. Sphenodesme ferruginea, Briquet in Engl. & Prantl Pflanzenfam. IV. 3A, 181 (1894). A shrub, probably climbing; branchlets and inflorescence rusty stellate-tomentose; branchlets obscurely quadrangular. Leaves chartaceous; ovate or elliptic, acute at apex, cuneate or obtuse at base; sparsely hispid-pubescent on the upper surface, especially on the nerves, softly ferruginous-tomentose on the lower; 3 to 5.5 in. long, 2 to 3.5 in. broad; midrib stout; main nerves 5 to 6 pairs, the lowest pair from close to the base, the next about 2 in. above it, both nearly straight to the margin and then along it, the rest curved to meet in a looped intramarginal nerve; transverse nervules irregular; petiole stout, 25 in. to 5 in. long. Panicles axillary or terminal, spreading, leafy, densely covered with tawny-yellow tomentum, the whole forming a thyrsus 12 in. or more in length and about as broad; peduncles 2 to 3 in. long, 3- or 5-chotomous, the two lower branchlets short-peduncled with each a pair of capitate heads, the two upper long-peduncled and again branching; heads 7-flowered supported by 6 spathulate bracts ·75 in. long and ·25 in. broad; buds obovoid; flowers sessile. Calyx tubular, densely stellate-tomentose without, whitish-villous within, ·25 in. long, 2-lipped, the lips variably lobed, usually the upper 2-lobed rather deeply cleft, the lower very minutely 3-toothed. Corolla-tube funnel-shaped, slightly curved, 3 in. long, tomentose without, densely villous within; lobes 5, 6 or 7, 2 in. long, linear or ligulate, twisted. Stamens included, inserted low down on the corolla-tube, usually somewhat irregularly but generally in 2 to 3-rows, if 3 rows and 7 stamens the upper row 3, the middle 2, the lower 2, these latter close to the base; filaments slender, glabrous, about 1 in. long; anthers reniform. Ovary columnar, glabrous; style extremely short; stigma very shortly bifid. Fruit not known. S. microstylis, Clarke in Hook. f. Fl. Br. Ind. IV. 600. Brachynema ferruginea, Griff. Notul. IV. 176.

SIAMESE STATES: Pungah, abundant! Curtis 2963; Tongka, fide Curtis.—DISTRIB. Burma (Moulmein & Mergui, Griffith (K.D.) 6007, in part; Tayoy, Parish), Siam (Murton 62).

The curious arrangement of the stamens inside the corolla-tube and the very short style are such well-marked characters that it would almost seem advisable to reconstitute the genus Brachynema, or else to bring together into one genus of 4 sections Sphenodesme with Symphorema and Congea. We are inclined to consider the latter the best course, but it should be done in discussing a Monograph of the Tribe rather than the few species found in a limited area.

2. Sphenodesme triflora, Wight Ic. t. 1478 (1850). A climbing (sometimes erect, *Kunstler*) shrub; branchlets dark brown, terete, rough with many small lenticels, a slight ring at the nodes. *Leaves*

chartaceous: lanceolate, bluntly acuminate at apex, cuneate at base; glabrous on both surfaces or the younger ones slightly velutinous; 3 to 5 in. long, 1 to 2 in. broad; midrib prominent beneath; main nerves 5 to 6 pairs, the lowest pair very inconspicuous, close to the margin, the next at about 25 in. from the base and 40° with the midrib, curving up to and along the margin, but not meeting the remaining 3 to 4 which curve at about 50° and meet in intramarginal loops; transverse nervules arched; reticulations netted; petiole 25 to 5 in. long, curved. Panicles very long, grey-pubescent, the lower branches leafy with ordinary leaves, the upper ones with gradually smaller leaves becoming bractlike: the branches very long, up to 2 ft., slender, scarcely 1 in. broad, bearing distant opposite pairs of 3-flowered capitate cymules each supported by a pair of reduced leaves and furnished with 6 spathulate bracts usually longer than the flowers and enlarging in fruit; flowers sessile, the corollas dark purple, the calvx and bracts dull red. Calyx tubular, 10-nerved, velutinous-pubescent without, densely villous within, 1 to 15 in. long; lobes 5, triangular, short. Corolla puberulous; tube cylindric, with a ring of hairs near the mouth within, .25 in. long; lobes 5, subequal, rounded. Stamens shortly exsert; filaments slender; anthers reniform, the cells somewhat divergent. Ovary pyriform, glabrous; style slender. Drupe ovoid or obovoid, sometimes constricted above, included in the enlarged prominently ribbed calyx, and supported by the 6 oblong-spathulate glabrescent enlarged bracts, which reach .5 to .75 in. long and .15 to .3 in. broad, and have 3 prominent nerves joined by transverse nervules; exocarp leathery. Seed 1, globose, completely filling the lower part of the cavity of the drupe, the upper part empty; cotyledons 1 in. in diam., including between them the remains of the placenta. Griff. Notul. IV. 182; Miq. Fl. Ind. Bat. II. 910; Clarke in Hook. f. Fl. Br. Ind. IV. 61. Congea Jackiana, Wall. Cat. 1735, partly.

Penang: at Ayer Etam, 1000 ft., Curtis 210. Perak: at Tapa and Jenah, Wray 683, 1383, 1752; at Gunting Bidai, Ridley 7598; at Salam, Scortechini 1119; in open jungle up to 500 ft., Kunstler (King's Collector) 160, 1098, 1623, 2474. Selanger: Semangko Pass, Ridley 12086, 12088. Malacca: Griffith (K.D.) 6009,1; Maingay (K.D.) 1196; at Sungei Udang, Derry 585. Johore: at Bukit Kayara, Ridley 11347. Singapore: Kampar jungles, Deschamps.—Distrib. Sumatra (Forbes, 3083).

3. Sphenodesme barbata, Schauer in DC. Prodr. XI. 623 (1847). A climbing shrub; branches dark brown, rough, lenticellate; innovations, branchlets and inflorescence patently rufous-hirsute. *Leaves* chartaceous; elliptic or elliptic-oblong or elliptic-lanceolate, suddenly and

obtusely acuminate at apex, also mucronate, acute or somewhat rounded at base; sparsely tawny-villous on both surfaces when young, glabrescent when old except on the nerves; 2 to 4 in. long, 1 to 1.5 in. broad; midrib conspicuous, ending in the mucro; main nerves 5 to 6 pairs, the lowest pair almost from the base, the next a little higher up, the rest more distant, curving to join in an intramarginal nerve; transverse nervules few but prominent; petiole 2 to 3 in. long, twisted. Panicles in terminal racemes of heads or in single or few pedunculate axillary pairs of heads; the heads 7-flowered, each with 6 spathulate bracts reaching .75 in. long and .25 in. broad and prominently nerved; peduncles 5 to 1.5 in. long, very slender; flowers sessile, corolla blue. Calyx campanulate, 15 to 2 in. long, densely long-rufous-hirsute without; lobes 5, short, triangular, each with often 1 or 2 subsidiary shaggy teeth. Corolla-tube cylindric, 1 in. long, glabrous below, villous in a ring at the throat within; lobes subequal, 125 in. long, oblongspathulate, pubescent without. Stamens inserted in the throat of the corolla-tube, exsert; filaments slender, glabrous; anthers oblong, cells parallel. Ovary rounded, densely villous; style slender, as long as stamens; stigmatic lobes 2, very short. Drupe small, globose or obovoid, included in the enlarged calvx, ferruginous-villous; exocarp Seed 1, globose, completely filling the cavity of the drupe; testa very thin; cotyledons thick, 05 to 1 in. in diam. Wight Ic. 1474 (ferruginea, R.W. in fig. 7); Miq. Fl. Ind. Bat. II. 910; Clarke in Hook, f. Fl. Br. Ind. IV. 601. Congea barbata, Wall. Cat. 1738.

Penang: Wallich 1738; at Tulloh Bahang, Curtis; Phillips. Malacca: Griffith (K.D.) 6009,2; Maingay (K.D.) 1194; Hervey.

4. Sphenodesme pentandra, Jack in Mal. Misc. I. 19 (1820), and in Hook. Bot. Misc. I. 285 (1830). A climbing shrub; branchlets obscurely quadrangular, lenticellate, pubescent, dark brown. Leaves subcoriaceous; elliptic-oblong, -ovate, or -lanceolate, bluntly acute or acuminate often mucronate at apex, rounded at base; both surfaces glabrous when old, the upper shining, the lower pubescent when young; the nerves beneath generally pubescent; 2 to 7 in. long, 1 to 2·5 in. broad; midrib stout; main nerves 7 to 8 pairs, the lowest very thin and close to the margin, the next a little above, curving to and along the margin almost to the tip, the rest more distant, curving to meet in a prominent looped intramarginal nerve; transverse nervules many, nearly at right angles to the midrib; reticulations netted, prominent; petiole 25 to 5 in. long, pubescent, channelled, curved. Panicles axillary and terminal, many-flowered, somewhat puberulous, often racemose, leafy and reaching 6 to 15 in. in length; the capitate heads in opposite pairs on slender ·5 to ·75 in.

long peduncles; flowers in each head 7, supported by 6 oblong-spathulate, obtuse, nearly glabrous, bracts .75 to 1.25 in. long, .25 to .35 in. broad, and with about 6 prominent nerves and reticulations; flowers blue or purple with a vellowish calvx and pale vellow bracts. Calyx campanulate or funnel-shaped, usually prominently 10-ribbed, nearly glabrous, 25 in. long; when young with 5 short lobes and a mucro in the angles between them, when old with 5 prominent acuminate aristate lobes, and 5 aristate teeth in the axils; reticulately nerved in the upper half. Corolla tubular, the tube 2 in. long, densely villous within in the upper half, glabrous in the lower; lobes leathery, rounded, 05 to 1 in. long, obscurely in 2 lips, the midlobe of the lower lip recurved, the rest spreading. Stamens 5, inserted a little below the mouth of the corolla-tube, long-exserted; filaments slender; anthers oblong, the cells parallel. Ovary densely tawny-villous; style very long, slender; stigmatic lobes 2, spreading. Drupe the size of a pea, globular (Roxb.). Seed 1, conform to the drupe; cotyledons unequal. Wight Ic. t. 1475 (S. Wallichiana, Schauer in letterpress); Griff. Notul. IV. 181; Clarke in Hook. f. Fl. Br. Ind. IV. 602; Briquet in Engl. & Prantl Nat. Pflanzenfam. IV. 3A, 181, fig. 67 E, F. S. Wallichiana, Schauer in DC. Prodr. XI. 622. S. Jackiana, Schauer l.c.; Mig. Fl. Ind. Bat. II. 299. S. acuminata, Wight Ic. t. 1476 (S. Jackiana, Schauer in letterpress). Roscoea pentandra, Roxb. Fl. Ind. III. 54. Congea pentandra and Jackiana, Wall. Cat. 1734, 1735. C. azurea, Wall. Cat. 1733, partly. Symphorema Jackianum, Kurz For. Fl. II. 255.

JUNKSEYLON OF TONGKA: Curtis. KEDAH: Coah on Langkawi Island, Curtis 2522; Ridley 8320. PENANG: Wallich 1735,1; Curtis 269. PROVINCE WELLESLEY: at Krian, Ridley 9391. PERAK: Scortechini 519; King's Collector (Kunstler) 3100, 4532, 7691, 10642. MALACCA: Griffith; Maingay (K.D.) 1195; Cuming 2388; Derry 40. PAHANG: Ridley 2160. Johore: at Bukit Songa, Ridley 11122.—DISTRIB. India (Assam, Khasia Hills, Burma), Borneo.

14. Congea, Roxb.

Large climbing shrubs, usually tomentose with mixed simple and stellate hairs. Leaves opposite, entire. Inflorescence of pedunculate, capitate, 3- to 9-flowered, involucrate cymes in large terminal panieles; the bracts at the base of the peduncles leaf-like, often white or coloured; the involucres of 3 or 4 elliptic or oblong or spathulate bracts connate at the base. Calyx tubular, funnel-shaped, slightly accrescent, 5-toothed. Corolla-tube slender, widening upwards, glabrate without,

usually villous within, 2-lipped; the upper lip of 2 lobes, the lower of 3, those of the upper lip the largest. Stamens 4 didynamous, inserted in the throat of the corolla, exsert; anthers oblong, the cells parallel. Ovary imperfectly 2-celled, 4-ovuled; ovules pendulous from the apex of the central placenta; style filiform, shortly bifid. Drupe small, obovoid, nearly dry, 1-seeded. Seeds conform to the drupe; testa membranous; cotyledons fleshy, unequal, enclosing the remains of part of the placenta; radicle very small, inferior.—Distrib. Four species, of Burma and Malaya.

Clarke in Fl. Br. Ind. says the drupes are 4-seeded, but every specimen we have examined affords one seed only, accompanied by the remains of the placenta and of 3 abortive ovules.

Involucral bracts reaching 1.5 in. by .75 in., white-tomentose; leaves beneath and inflorescence more or less ferruginous-villous, and with about 5 to 6 pairs of main nerves ... 1. C. vestita.

Involucral bracts reaching 1.25 in. by .3 to .4 in., pale lilac, tomentose; leaves beneath and inflorescence softly tomentose and with about 4 pairs of main nerves ... 2. C. tomentosa.

1. Congea vestita, Griff. Notul. IV. 174 and Ic. Pl. Asiat. t. 458, fig. 21 (1854). A large climbing shrub; branchlets patently fulvoushirsute, striate. Leaves submembranous; ovate or elliptic, sharply acute at apex, obtuse or shortly cordate at base; upper surface scabrouspubescent, ferruginous-villous on the nerves, lower villous and greytomentose; 3 to 7 in. long, 1.5 to 3 in. broad; midrib slightly impressed above; main nerves about 5 to 6 pairs, curving upwards to and along the margin; transverse nervules many, but, like the reticulations, obscure; petiole 25 to 5 in. long, with long tawny hispid hairs. Panicles very large; bracts leaf-like, whitened; involucral bracts 4, very slightly connate at base, elliptic-obovate, often bifid at apex. reaching 1.5 in. long by 75 in. broad, densely white-tomentose, with prominent reticulations and 3 pairs of main nerves; flowers rosecoloured. Calyx funnel-shaped, ribbed, 25 to 35 in. long, densely white-villous without and within; teeth 5, triangular, acuminate. Corolla-tube slender below, gradually widening upwards, 3 to 35 in. long, glabrous without, also within except a thick villous ring below the throat; upper lip of 2 ovate-oblong erect or recurved lobes, lower of 3 lobes half as long as the upper, the side lobes erect, the third lobe decurved, all thin, glabrous, with brown nervules. Ovary oblongobovoid, glabrous except a few glands at the tip. Drupe nearly dry, obovoid. Clarke in Hook. f. Fl. Br. Ind. IV. 603.

Province Wellesley: Arakuda woods, Ridley 6993.—Distrib. Tenasserim.

2. Congea tomentosa, Roxb. Cor. Pl. III. 90. t. 293 (1819). A large climbing shrub; branchlets densely tawny-tomentose. Leaves coriaceous; ovate, acute at apex, rounded at base; upper surface glabrous except on the nerves, lower tawny-tomentose; 2 to 4 in. long, 1 to 2.5 in. broad; midrib stout; main nerves about 4 pairs, curving upwards, joined by many regular transverse nervules; petiole tawnytomentose, 25 in, long. Panicles terminal, reaching about 6 in, long and 9 in. broad, 3-chotomous, densely tawny-tomentose; branches long-(2 to 2.5 in.) peduncled, racemose, bearing pairs of heads on .5 in. long peduncles; bracts leaf-like, caducous; involucral bracts 4 to each head, pale lilac, ovate or spathulate, slightly emarginate, densely tomentose, ·75 to 1·25 in. long, ·3 to ·4 in. broad, with 4 to 5 pairs of main nerves. Calyx funnel-shaped, densely villous especially within, 25 in. long; teeth 5, 05 to 1 in. long, triangular. Corolla-tube slender, slightly longer than calvx, glabrous except a ring of villous hairs at the throat within; 2-lipped, the upper lip long deeply bifid, the lower of 3 short lobes, the midlobe the longest. Stamens long-exsert. Ovary obovoid, pyriform, glandular at tip; style very slender; stigmatic lobes 2. Drupe obovoid, nearly dry; exocarp crustaceous, smooth. Seed 1, nearly filling the cavity of the drupe, with 3 abortive ovules; testa very thin; cotyledons thick, unequal, somewhat emarginate. Wight Ic. t. 1479,2 or 1565; Schauer in DC. Prodr. XI. 623; Kurz For. Fl. II. 256; Miq. Fl. Ind. Bat. II. 911; Clarke in Hook. f. Fl. Br. Ind. IV. 603. Roscoea tomentosa, Roxb. Fl. Ind. III. 57. Calochlamys capitata, Presl Bot. Bemerk. 149.

SOUTH-WEST SIAM: at Poongah, Curtis 2903, 2962.—DISTRIB. India (Chittagong), Burma, Siam. Often cultivated.

The involucral bracts of our specimens do not agree very well with those figured in the 'Coromandel Plants,' but they agree better with the authentic specimens. We have not been able to make quite sure whether our specimens belong to type tomentosa or to the var. azurea (C. azurea, Wall. Cat. 1733), but we think to the latter.

The following species seems worthy of description here, as possibly also occurring in the Peninsula.

Congea Forbesh, King & Gamble in Kew Bull. 114 (1908). A large climber, spreading over great forest trees; branchlets rather slender, hoary-pubescent. Leaves chartaceous; oblong or oblong-lanceolate, shortly acuminate at apex, rounded and slightly cordate at base; upper surface shining, glabrous except the puberulous nerves; lower surface softly pubescent, reddish-brown when dry; 3 to 5 in. long, 1 to 1.5 in. broad; midrib strong, impressed above, as are the 5 to 6 pairs of main nerves which start at about 30° with the midrib and curve upwards to and along the margin; transverse nervules many, horizontal; reticulations netted; petiole 2 in. long, tawny-pubescent. Panicles terminal, tawny-pubescent, racemose, reaching about 12 in. in

length and 6 in. in breadth; main branches usually 1 pair only, with slender 1 to 1.5 in peduncles; heads in pairs on short (·2 to ·3 in. long) peduncles, the pairs 1 to 2 in. apart along the raceme; bracts leafy, coloured; involueral bracts 4, grey-tomentose, oblong-spathulate, 1 to 1.5 in. long, ·4 in. broad, within them a pair of linear-setaceous bracteoles about ·3 in. long; flowers light purple. Calyx tubular, funnel-shaped, densely villous on both sides but especially within, ·3 in. long; teeth triangular, ·075 in. long, acute. Corolla-tube cylindric, slender, ·3 in. long, glabrous except the ring of villous hairs at the mouth within; 2-lipped, the upper lip of 2 lobes longer than the 3 lobes of the lower, margins of the lobes crenulate. Ovary obovoid, glabrous except a few glandular dots at top; style very slender. Drupe obovoid, dry; exocarp crustaceous, smooth, tipped with the persistent base of the style. Seed 1, with the remains of the placenta and 3 abortive ovules; testa extremely thin, membranous; cotyledons unequal, one concave, the other convex, fleshy, ·125 in. in diam., the apex depressed; radicle very small.

Sumatra: in deep forest. Lampongs, Forbes 1567.

Tribe V. AVICENNIEÆ.

15. AVICENNIA, Linn.

Shrubs or small trees with long creeping roots which give out at intervals narrow, conical, leafless suckers. Leaves coriaceous, opposite, entire. Flowers small, sessile, in capitate pedunculate heads of close centripetal cymes which are in pairs in the upper axils or in short terminal trichotomous thyrsi or corymbs; bracts small, shorter than the calvx. Calyx short, 5-partite, unaltered in fruit; segments ovate, coneave, deeply imbricate. Corolla-tube short, cylindric; lobes 4, subequal or the posterior lobe slightly the largest. Stamens 4, inserted on the corolla-throat; filaments short; anthers shortly exsert; cells ellipsoid, parallel. Ovary imperfectly 4-celled by a 4-winged central axis; ovules 4, pendulous between the axial wings; style tapering; stigma bifid. Fruit a compressed capsule, dehiscent by 2 leathery valves. Seed solitary, erect; embryo imperfectly covered by the 2 integuments; albumen none; cotyledons large, longitudinally plicate; the radicle inferior, thick, villous, the plumule conspicuous, developing before the seed falls.—DISTRIB. Muddy estuaries and sea-coasts of the warmer regions of the globe; species 4 or 5.

1. AVICENNIA OFFICINALIS, Linn. Sp. Pl. 110 (1753). A small tree with greyish-brown thin bark and many blind root-suckers; branchlets pale brown, subquadrangular, glabrous when old; young ones, young leaves and inflorescence with very close pale tomentum. Leaves coriaceous; elliptic-oblong or obovate, obtuse at apex, attenuate at base; upper

surface glabrous, smooth and shining, lower surface pale and with a hard, very thin, grey or tawny tomentum, at length glabrate; 2 to 4 in. long, 1 to 2 in. broad; midrib stout, very prominent; main nerves 6 to 8 pairs, at first straight, then curving to anastomose near the margin; reticulations netted; petiole stout, 25 to 75 in. long. Flowers sessile, in small heads on rigid angular peduncles either 2 together in upper axils or several in short terminal thyrsi; bract and 2 bracteoles concave, thick, shorter than the sepals; flowers in each head 3 to 6; corolla orange-yellow. Calyx-segments thick, 1 to 3 in. long, ovate or suborbicular, scarious-ciliate on the margins, the lower part of the back pubescent, the rest glabrous. Corolla-tube very short, cylindric; lobes 4, ovate, acute or rounded at lip, subequal, 2 in. long, pubescent without, nearly glabrous within. Stamens exserted; filaments 1 in. long; anthers ·05 in. long; cells parallel, ellipsoid. Ovary conoidal, tapering into the style, together 25 in. long; stigmatic lobes curved. Capsules 1 to 1.5 in. long, ovoid, compressed, beaked, green with greyish tomentum. Seed 1, completely filling the capsule. Schauer in DC. Prodr. XI. 700; Bedd. For. Man. in Fl. Sylv. CLXXIV., and Anal. Gen. t. 22, fig. 2; Brandis For. Fl. 371; Trimen Fl. Ceyl. III. 363; Clarke in Hook. f. Fl. Br. Ind. IV. 604; Mig. Fl. Ind. Bat. II. 912; Koord. & Val. Bijdr. VII. 217; Cooke Bomb. Fl. II. 435; Prain Beng. Plants 838. A. resinifera, Forsk.; Done in Nouv. Ann. Mus. III. 402. A. tomentosa, Br. Prodr. Flor. Nov. Holl. I. 518; Roxb. Fl. Ind. III. 88; Wall. Pl. As. Rar. III. 44, t. 271; Wight Ic. t. 1481; Blume Bijdr. 821; Griff. Notul. IV. 185; Kurz For. Fl. II. 276. Halodendron Thouarsii, Roem. & Sch. Syst. III. 485. "Mangium album," Rumph. Herb. Amb. III. t. 76. "Oepata," Rheede Hort. Mal. IV. t. 45.

Penang: Wallich 1742; Curtis 3533. Malacca: Griffith (K.D.) 6069; Maingay (K.D.) 1208. Singapore: T. Anderson 79; River valley road, Ridley 10370; Hullett 163.—Distrib. Coasts of India, Ceylon, Burma, Java, eastwards to the Pacific: in tidal creeks and on muddy coasts.

2. AVICENNIA ALBA, Blume Bijdr. 821 (1826). A shrub or small tree; branchlets pale brown, shining, obscurely quadrangular; innovations and inflorescence shortly appressed, whitish- or tawny-tomentose. Leaves coriaceous; lanceolate, acute or acuminate at apex, attenuate at base; glabrous on both surfaces or whitish-tomentose beneath (especially when young); 2 to 5 in. long, 75 to 2 in. broad; midrib prominent; main nerves 8 to 10 pairs, curving upwards to anastomose near the margin; secondary nerves few, meeting few arched transverse nervules, all somewhat raised on the upper surface; petiole thick, 25 to 5 in. long. Flowers sessile, either in small capitate heads or in distichous spikes in short terminal or axillary panicles; rachises and peduncles

angular; bract and 2 bracteoles concave, thick, shorter than the senals. the bract orbicular, ciliate, the bracteoles ovate, ciliate, acute. Caluxsegments thick, 1 in. long, ciliate, slightly pubescent on the back near the base, above glabrous and rugose. Corolla-tube very short, sometimes almost none; lobes 4, ovate, concave, acute at tip, the posterior one sometimes bifid, 1 in, long, glabrous. Stamens included: filament ·03 in, long; anthers ·02 in, long, oblong; cells parallel. Ovary columnar, with very short conical villous style, together 05 to 1 in. long: stigmatic lobes 2, erect, thick, minute. Capsules .5 to .75 in. long, obpyriform, gibbous on one side, acute or acuminate: pericarp green (Kunstler) with greyish tomentum. Seed 1, completely filling the lower part of the capsule. Wight Ic. t. 1482: Mig. Fl. Ind. Bat. II. 913; Cooke Bomb. Fl. II. 436; Koord. & Val. Bijdr. VII. 221; Prain Beng. Plants 838. A. officinalis, Linn., var. alba, Clarke in Hook. f. Fl. Br. Ind. IV. 604. A. resinifera, Griff. Notul. IV. 186, and in Trans. Linn. Soc. XX. 6, fig. 1. A. intermedia, Griff. l. c. A. officinalis, Kurz For. Fl. II. 275.

Province Wellesley: in mangrove swamps, Curtis. Dindings: Pangkore, Scortechini 963. Malacca: Griffith (K.D.) 6070, 6071; Maingay (K.D.) 1209. Singapore: Kunstler (King's Collector) 1152. —Distrib. India, Burma, Java, Borneo, Celebes, to North Australia, in tidal creeks.

Koorders & Valeton draw attention to the capitate heads shown in Wight's drawing, and refuse to quote t. 1482. We have seen Koorders' Nos. 9696 and 22009 from Java, which have the heads spicate, as do Kunstler's specimens No. 1152. Haviland's Borneo specimens are partly spicate, partly capitate; Scortechini's Pangkore specimens are capitate. But in all the structure of the flowers is the same and agrees with that given in Wight's drawing, so there seems no room for even a variety.

ADDENDA-CORRIGENDA.

Vol. LXXII. II. PART No. 14 (1903).

Page 113, line 21, for "inner" read "upper"

P. 114, 1. 7, for "ovate" read "obovate"

P. 117, omit the whole of lines 7, 8 and 9.

P. 152, l. 4 from below, for "Perakensis" read "Perakense" Pages 187, 188, omit the whole of 19, Trisciadia, Hook. fil.

Vol. LXXIII. II. PART No. 15 (1904).

- P. 51, l. 23, after "Wallich." insert "Perak: Wray 2104, 3271; Scortechini; Ridley 8374; King's Collector 5508, 6431, 6545.—DISTRIB. Andaman Islands; Sumatra; Java, Forbes 2504."
 - P. 51, l. 11 from below, before "flowers" insert "greenish-white"
 - P. 52, 1. 25, after "Flowers" insert "white, sweet-scented,"
 - P. 57, at top of page, insert "34. Knoxia, Linn."
 - ", ", l. 3 from below, before "Canthium" insert "35."
- P. 59, l. 11 from below, for "Fruit when ripe . . . glabrous." read "Fruit oblong, obovoid, 1 in. long, yellow, pulpy, acid in taste."
 - P. 60, l. 20, for "Fruit unknown." read "Fruit black when ripe."
 - " " l. 5 from below, after "Fruit" insert "orange,"
 - P. 62, 1. 20, for "my" read "our"
 - P. 64, l. 12, after "Flowers" insert "rosy-white, nearly 1 in. in diam.,"
 - P. 66, l. 2, after "bracteolate" insert "; flowers green."
 - P. 67, l. 13, after "Flowers" insert "white,"
 - ", ", 1. 7 from below, after "calyx;" insert "flowers white."
 - P. 68, l. 16, after "pubescent" insert "; flowers white."
 - " " 1. 2 from below, after "bracteoles" insert "; flowers white."
 - P. 69, 1. 18, after "base" insert "; flowers white."
 - ", ", 1. 4 from below, after "bracteolate" insert "; flowers white."
 - P. 70, 1. 15, after "linear" insert "; flowers white."
 - P. 73, l. 3, after "bract" insert "; flowers white."
 - " " l. 9 from below, after "Flowers" insert "red,"
 - P. 74, l. 22, after "long" insert "; flowers white."
 - P. 75, 1. 3, after "persistent" insert "; flowers white."
 - " ,, l. 5 from below, after "tube" insert "; flowers scarlet."

- P. 78, I. 8, before "smaller" insert "white and"
- P. 79, l. 6, after "shorter" add:—
- "Mr. Ridley says this variety is *I. stenophylla*, Ridl. in Trans. Linn. Soc. Ser. 2, iii. 311 (1893), at any rate so far as the l'ahang plant is concerned; he considers it a good species."
- P. 79, l. 5 from below, after "minute" insert "; flowers orange."
- P. 80, 1. 5, for "Scortechini" read "Scortechinii."
- ", ", l. 15, after "puberulous" insert "; flowers red."
- " " l. 12 from below, after " minute " insert "; flowers red, orange or yellow."
 - P. 81, 1. 24, after "minute" insert "; flowers orange red."
 - P. 88, 1. 7 from below, after "common" insert ", a sea-shore plant."
 - P. 89, 1. 3 from below, after "flowers" insert "violet,"
 - P. 91, 1. 8, after "long" add:
 - "Mr. Ridley thinks it is a new species of Timonius."
 - P. 94, l. 9, after "Flowers" insert "pink,"
 - " ,, l. 5 from below, after "Flowers" insert "white,"
 - P. 95, l. 8, omit "S. longicaulis, Br. in Wall. Cat. 826."
 - ", , 1. 20, after "Flowers" insert "white,"
 - P. 102, after line 12 add as note:—
 - "Mr. Ridley remarks the occurrence of Myrmecodia echinata, Gaudich., which is not rare near the sea—Pahang: Ridley 1462. SINGAPORE: Ridley 5869, 8067."
 - P. 105, l. 21, after "pedicels" insert ", white, bracts purple."
- P. 106, l. 7, after "long" insert "ochre-yellow, honey-scented." and at line 11 after "Fruit" insert "bright light blue,"
 - P. 111, l. 20, for "lucidus." read "Lowianus."
 - P. 132, I. 3 from below, for "LUCIDUS" read "LOWIANUS"
 - P. 134, l. 15, for "BC." read "Blume"

Vol. LXXIV. II. Extra Number. Part No. 16 (1905).

- P. 4, I. 8, for "Scandent" read "Erect"
- P. 5, l. 12 from below, after "Fruit" insert "white, fleshy,"
- P. 6, 1. 5, after "Fruit" insert "white,"
- P. 8, 1. 23, for "climber" insert "plant, creeping on tree stems, often" ..., 1. 6 from below, after "Fruit" insert "white, showy,"
- P. 37, l. 20, after "obtuse" insert "; flowers lavender-coloured."
- P. 39, 1. 2, after "24" insert "; Hook. f. Fl. Br. Ind. III. 336;"; line 3, for "Calcalia" read "Cacalia"; and line 4 for "E." read "C."

- P. 48, at the end of Order LXI. Composite, add:-
- "Since the description of this Family was written, the following species have been noticed as additions to the Flora:

Tribe VERNONIEÆ.

Sparganophorus Vaillantii, Gaertn. Fruct. II. 396 t. 165. A roadside weed, introduced from the West Indies, common in Singapore.—Ridley, Deschamps.

Vernonia elæagnifolia, DC. Prodr. V. 22. At Pekan, Pahang, fide Ridley.

Tribe ASTEROIDEÆ.

Erigeron linifolius, Willd. Sp. Pl. III. 1955. An escape or garden weed, common.—Penang, Curtis 3389, 3401.

Grangea maderaspatana, Poir.; DC. Prodr. V. 373. Kedah, Curtis 3809.

Tribe Inuloideæ.

Blumea myriocephala, DC. Prodr. V. 445. Selangor, Curtis, 2350. Casulia axillaris, Roxb. Hort. Beng. 62, fide Ridley.

Tribe HELIANTHOIDEÆ.

Enhydra fluctuans, Lour. Fl. Cochinch. 511. Penang, Curtis 3455. Acanthospermum xanthioides, DC. Prodr. V. 521. An introduced weed in Singapore, fide Ridley."

- P. 49, line 13, after "Flowers" insert "bright mauve,"
- P. 53, I. 10, for "purple" read "pale blue"
- P. 54, l. 24, for "adnatus" read "adnatum"
- P. 55, l. 5 from below, omit "SINGAPORE; Lobb."
- " " lines 4 to 2 from below, omit "Ridley (Trans. Linn. Soc., &c. . . . common."
 - P. 56, l. 14 from below, for "Salian" read "Tahan"
 - " " l. 4 from below, for "marcescent" read "accrescent"
 - P. 58, l. 19, at beginning insert "Province Wellesley: common."
 - P. 61, l. 23, for "microphylla" read "microphyllum"
 - P. 64, l. 13 from below, for "white" read "pink"
- P. 66, l. 11, after "shrub" insert "or small tree or an epiphyte on lofty trees"
 - P. 66, l. 14, after "paler" insert "often bright red when fresh"
 - ", " 1. 22, after "Corolla" insert "pink or white,"
 - P. 67, 1. 29, after "long" insert ", pink, fragrant,"
 - " ,, l. 7 from below, after "Fruit" insert "black, edible,"

P. 72, at the end of DIPLYCOSIA add note:—

"D. lancifolia, Ridley in Journ. Str. Br. R. As. Soc. No. 39, 15 (1903) from Gunong Benom in Pahang, has been omitted."

P. 91, at end of GENTIANACEÆ add note:

"Ridley says that Exacum tetragonum, Exacum pedunculatum and Canscora diffusa, only admitted on the authority of Lobb's specimens which are of very doubtful locality, ought probably to be excluded. He would add Limnanthemum cristatum, Griseb. found at Singapore and at Batu Pahat river, Johore."

Part No. 17 (1905).

Page 123, line 5, after "Berry" insert "white."

P. 131, last line, after "1808" insert "SINGAPORE: Changchukang, Ridley 3653, 3844 (fide Ridley)."

P. 171, line 28 after "101;" insert "Regensb. Fl. 578 (1855); Walp. Ann. V. 475. Ceratophorus Leerii,"; and line 31, for "King's Collector" read "Wray"

P. 175, l. 26, for "(?)" insert "about 20 feet high"; and last line, before "Ridley" insert "in the Bukit Kutu woods,"

P. 191, l. 10, after "60" insert "to 80"; and for "10 to 15 in." read "3 to 4 feet."

P. 193, Il. 18, 19, for:—

"It has is " read " old trees of any size have become scarce in a wild state, seedlings being still plentiful, but it is "

P. 196, l. 8, for "(?)" read "reaching 50 to 60 feet in height" and line 29, add:—

"The timber is heavy and is used in house-building (Ridley)."

P. 237, I. 1, after "144" insert "; Brand Monog. Sympl. 40."

P. 254, 1. 21, for "7348" read "7848."

P. 257, last line but two add:—"Remarkable among Jasmines for having white instead of black fruit (Ridley)."

P. 272, l. 14, to note add :=

"Ridley says this is Linociera lancifolia, Ridley in Journ. Str. Br. R. As. Soc. No. 39, 14 (1903)."

PART No. 18 (1905).

Page 280, line 14, after "sessile" insert ", white,"

P. 284, after line 12, insert note:—

"Ridley says that he found Ehretia buxifolia, Roxb. Cor. Pl. I. 42, t. 57 along the Rumpin River in Pahang. We have seen no specimens."

Page 292, line 19, after "Flowers" insert "white,

P. 295, l. 4, after "Wray 2580!" put ";" instead of "." and for "Malacca: Bujong" read "Bujong Malacca,"

P. 335, l. 13, add:—"Common on the sea-shore (Ridley)" and to the note after "species." add:—

"Ridley writes that Solanum mammosum, Linn. Sp. Pl. 187 should be added as it is thoroughly established and a conspicuous feature of the scenery on waste ground in Selangor and Perak. It is also common in old tin mines. No specimens have been seen."

P. 339, 1. 9, for "C." read "P."

P. 340, l. 15, to note add:—

"Ridley says the purple-flowered variety is by far the commonest, but is not wild and is found on waste ground only."

P. 340, last line but 2, for "all" read "some of" and after "provinces" insert "sparingly,"

P. 348, l. 20, delete "Herpestris pygmæa, Griff. Notul. IV. 104."

P. 348, 1. 25, after "Flowers" insert "violet with white throat,"

P. 350, 1. 8, for "SESSIFLORA," read "SESSILIFLORA,"

P. 352, l. 4 from below, *omit* "white or white and pink" and after "exserted" add "; tube and back of upper lip cherry red, lower lip white with a yellow central spot, stigmas yellow (*Ridley*)."

P. 354, l. 3, for "ASIATICA, Linn. Sp. Pl. 619" read "ATROPURPUREA Ridley n. sp."

P. 354, lines 12 to 17, omit all the references.

P. ,, ,, 19, 20, omit "DISTRIB. &c. to end."

P. "line 21, for "Benthamiana..... 226" read "cælestis, Ridley, n. sp."

P. 354, lines 29 to 31, omit all the references.

P. ,, line 22, omit "DISTRIB. &c."

P. 355, at the end of the genus Torenia add note:-

"Ridley says that T. Benthamiana, Hance, is often cultivated but is not established. He also says that T. mucronulata, Benth. in DC. Prodr. X. 409 should be added with the following localities. Penang: Waterfall and Government Hill, Curtis, 1837. Trengganu: Bundi, Rostado. Dindings: Gunong Tungul, Ridley 9444. Pahang: at Tahan River, Ridley. Singapore: Garden jungle, Bukit Timah, Ridley 6894."

P. 357, I. 8, after "Corolla" insert "light blue,"

PART No. 19 (1907).

Page 399, lines 23, 24, for:—

"But the author gives no explanation of his drawings," insert "and the author uses the term 'funiculus umbilicalis.'"

- P. 469, line 16, at the end change "." to ";" and in line 17 omit "S. caudatus,"
 - P. 470, l. 15, for "193." read "192."
- P. 532, l. 7 from below, for "selangorica, King & Gamble, n. sp." substitute "carnosum, Merrill & Rolfe in Philipp. Journ. Sc. III. (1908) 121."
- P. 533, l. 9, after "all" add "Oxystelma carnosum, R. Br. Prodr. Fl. Nov. Holl. 462; Dene. in DC. Prodr. VIII. 543. Cynanchum carnosum, Schltr. in Perkins Fragm. Fl. Philipp. 120, Vincetoxicum carnosum, Benth. Fl. Austral. IV (1869) 331."

Page 533, l. 11 at end, add "Australia."

- P. 543, l. 17, for "Patch" read "Patch"
- P. 546, l. 12, for "Hort. Ham." read "Herb. Buch.-Ham."
- P. " , 4 from below, for "Tjuk" read "Ijuk"
- P. 549, at end of PERGULARIA insert note:-
- "According to N. E. Brown (Kew Bull. 323 (1907)) the generic name Pergularia really belongs to *Dæmia* and (This.-Dyer Fl. Cap. IV. i. 775) the species described under *Pergularia* must be renamed under Telosma, Coville."
- P. 554, line 19, omit "MALACCA: Griffith 3764."
- P. 574, l. 12, after "rounded" insert "or cuneate"
- P. 579, lines 6 to 10, for "Wall. Cat. t. 4545" read "Lindl. Bot. Reg. (1847) t. 54; Hook. Bot. Mag. t. 4545; Wall. Cat. 8171; Dene. in DC. Prodr. VIII. 633; Miq. Fl. Ind. Bat. II. 513."
 - P. 586, after line 7, insert note:
 - "For a discussion of the curious modifications of the leaves of D. Rafflesiana, D. complex, and other species, see the following: Treub in Ann. Buit. III. 13; Scott & Sargent in Ann. Bot. VII. 243; This.-Dyer in Ann. Bot. XVI. 365; H. H. W. Pearson in Journ. Linn. Soc. XXXV. 376."

PART No. 20 (1907).

Page 637, line 10 from below, for "T. Anders." read "Wall."

- P. 641, l. 7, for "E" read "S"
- P. 646, lines 12, 13, omit "H. phlomoides" and transfer "Miq. Fl. Ind. Bat. II. 779;" to after "DC. Prodr. XI. 90;"
 - P. 683, line 17, for "Wall." read "Nees"
 - P. 700, last line of analysis, omit "18. Cymaria" and insert
 - "Anthers 2-celled; upper lip of corolla merely notched ... 18. CYMARIA. Anthers 1-celled; upper lip of corolla 2-lobed ... 19. ACRYMIA."
- P. 701, line 4 from below, after "places" insert "Penang: Deschamps. Province Wellesley: Ridley 7168. Selangor: at Kwala Lumpur, Ridley 10204. Singapore: Hullett 63, 175.

Andamans at Port Blair, Kurz, King, Prain. NICOBARS: Car Nicobar Moos, King's Collectors; Katchall, Kurz."

- P. 702, l. 19, for "Perak Malacca" insert "Penang: Wallich 2713 E; at Santong Sotong, Curtis 2492. Dindings: at Pangkore (marked? introduced) Scortechini 1017. Andamans: S. Andaman, King."
 - P. 702, lines 27 and 30, for "graveolens" read "suaveolens"
- P. 704, line 4, for "Perak: Kunstler" insert "Kedah: Langkawi, on the small islands, Curtis 2577. Perak: near Bernani River at 300 to 400 ft., Kunstler 8813."
 - P. 705, l. 10 from below, at end, insert "Singapore: Kunstler 89."
- P. 707, after "Provinces." insert "Penang: King, Deschamps. Perak: at Jenah, 200 to 300 ft., Wray 1759. Malacca: Griffith 3957. Singapore: Wallich 2733; Schomburgk."
- P. 708, lines 19 and 20, for "SINGAPORE.... 7603!" read "PERAK: Upper Perak, Wray 4046; Rawang, Ridley 7603. PAHANG: Tahan River, Ridley 2131! MALACCA: Griffith 3966! SINGAPORE: G. Thomson; Bukit Panjang, Ridley 3951; Gunong Bintang, Kunstler 255"; and at line 22, after "cultivation," add "Sumatra (in Eastern Sumatra, T. Daud-Herb. Ridley 11336; at Kitta Djawar in open and sunny waste places in Lampongs, Forbes 1416A)."
 - P. 709, line 9, after "Wray" insert "1682."
- P. 710, l. 28, for "In all the provinces" read "Kedah: Langkawi Curtis. Penang: Balick Polo Road, Curtis 868; Deschamps. Perak: Scortechini. Pahang: Katapong, Ridley 1286. Malacca: Hervey; Griffith. Johore: Kwala Kanary, Lake & Kelsall 4028. Singapore: Kunstler 128; Hullett 19: T. Anderson 148. Nicobars: Kamorta, Kurz; Car Nicobar, King's Collectors."
 - P. 710, after line 28, at end of Dysophylla insert the following:—
- 2. Dysophylla verticillata, Benth. in Wall. Cat. 1544 (1828). An annual herb. Stems laxly branched, rarely simple, 6 in. to 3 ft. high, glabrous or nearly so. Leaves in whorls of 4-10, glabrous, linear, subacute, margin entire or obscurely toothed; 1-3 in. long, 15 to 25 in. wide; petiole short or 0. Flowers in villous or tomentose cylindric terminal spikes, 1-2 in. long, 2 in. in diam.; whorls of cymes close-set throughout. Calyx in fruit 08 in. long, campanulate; teeth subequal, triangular, stellately spreading. Corolla 08 in. long, pinkish; tube slender, hardly exserted; lobes pubescent. Filaments exserted, hairy. Nutlets ellipsoid. Benth. in Wall. Pl. As. Rar. I. 30, in Lab. Gen. & Sp. 159, and in DC. Prodr. XII. 157; Thw. Enum. Pl. Zeyl. 239 (in part); Hook. Fl. Br. Ind. IV. 639. D. ramosissima, Benth. in Wall.

Cat. 1543. D. Benthamiana, Hance in Ann. Sc. Nat. Ser. 5, V. 234. Mentha stellata, Lour. Fl. Cochin-Chin. 36. M. verticillata, Roxb. Hort. Beng. 44, and in Fl. Ind. III. 5. Pogostemon verticillatus, Miq. Fl. Ind. Bat. II. 965.

Kedah: Langkawi, Coah, Curtis 2098! Distrib.—Throughout South Eastern Asia, and in Australia.

Page 714, line 15, for "Perak: Scortechini" read "Kedah: Kedah Peak, Ridley or Curtis. Perak: Harans, Scortechini 788!"

P. 715, l. 6 from below, for "In all the provinces" read "Selangor: Ridley 7601. Andamans: S. Andaman, King's Collector. Nicobars: Nancowry, King's Collector."

P. 717, l. 26, after "escape" add "MALACCA: Bukit Bruang, Hervey."

P. 719. l. 10 from below, after "Deschamps!" add "; Hullett 9. Penang: Deschamps. Province Wellesley: G. King. Perak: Thaipeng, Scortechini 7, 482; Telukanson, Ridley 10769," and after "Griffith!" insert "Andamans: S. Andaman, King's Collector."

P. 720, l. 23, after "1115!" insert "at Tanjong Joking, Curtis 2491; Deschamps. Province Wellesley: Butterworth, G. King. Malacca: G. King"; and line 24, after "48!" insert "Hullett 9."

P. 721, l. 14, after "places" insert "Selangor: Pudok, Goodenough 10462. Pahang: at Pekan, Ridley 1164."

P. 722, l. 17, after "7095!" insert "Larút at 500 to 1000 ft., King's Collector 2372."

P. 724, l. 18, after "Wray!" insert "Goping, Kunstler 467."

P. 725, l. 24, at beginning, insert "Pahang: at Pulau Tawar, Ridley 2148, also at Kwala Tanbeling," and lines 26 to 31, omit "It has..... Materials" and add "Ridley has also collected in Johore at Bukit Saga (No. 11130) a plant, also with white flowers, which agrees with G. oblongum in every character except in having calyx-teeth much shorter than the tube."

P. 726, l. 3, after "1310!" insert "gathered in Botanic Garden, from a plant sent from Waterloo, Perak, Curtis 2166."

P. 727, after line 4, the end of LABIATE, insert the following:-

19. ACRYMIA, Prain in Kew Bull. for 1908, 114 (1908).

Undershrubs. Flowers small, in lax, many-flowered, peduncled, raceme-like, axillary cymes. Calyx erect, 10-nerved, the intermediate nerves weaker than the other 5, equally 5-toothed; the tube in fruit urceolate; throat within naked. Corolla-tube slightly enlarged upwards, shortly exserted; limb 2-lipped; lower lip 3-lobed, spreading, the midlobe larger than the lateral; upper lip suberect, 2-fid, not arched.

Stamens 4, exserted, didynamous, the upper pair shorter; anthers 1-celled. Disk small, equal, entire. Style-arms unequal, the upper very short. Nutlets obovoid, rugosely pitted; hilum very large, lateral.—DISTRIB. Species 1, endemic.

The genus Acryma is closely allied to Cymaria, with which it agrees as regards inflorescence and fruit, but from which it differs in having a 2-lobed upper lip that does not conceal the 1-celled anthers. Though much smaller, the corolla of Acrymia resembles rather closely the corolla of Ajuga, a genus in which the anther-cells, though usually discrete, are sometimes at length confluent. In habit, however, Acrymia is unlike either of the genera to which it is so closely allied, and recalls that met with in an Indian group of species belonging to the genus Gomphostemma, which includes G. ovatum, Wall., and G. Mastersii, Benth.

ACRYMIA AJUGIFLORA, Prain in Kew Bull. 115 (1908). A dwarf undershrub. Stems woody, prostrate and rooting below, 2-3 in. long, densely leafy above. Leaves opposite, petioled, elliptic, obtuse, crenate except the sometimes unequally cuneate, or occasionally subtruncate base; dark green above, paler beneath, fulvous-strigose on both sides, especially along the 5-7 pairs of main nerves and the secondary reticulate veins; 4.5-8 in. long, 2-3.5 in. wide; petiole .75-2 in. long, fulvousstrigose. Cymes dichotomously branching, with terminal flowers: flowers on the branches secundly arranged; main-peduncles strigose, slender, 75-1.25 in long; bracteoles subulate, shorter than pedicels. Calyx in flower campanulate, 08 in. long, in fruit urceolate, 15 in. long, strigose on the nerves externally; teeth 5, equal triangular as long as the portion of tube above the constriction; pedicels slender, strigose, 07-1 in. long. Corolla white, 25 in. long, glabrous; tube shortly exserted; lower lip spreading, 3-lobed, mid-lobe obovate; upper lip suberect, 2-lobed, lobes oblong, hardly exceeding lateral lobes of lower lip. Filaments exserted, hirsute at base, glabrous elsewhere; anthers 1-celled. Nutlets obovoid, 02 in. long, wide-reticulate; at first sparsely pubescent, at length glabrescent.

Perak: On limestone rocks, in dense jungle, 500-800 ft., Kunstler (King's Collector) 10709!

Part No. 21 (1908).

P. 795, 1. 8, for "Sphenodesma." insert "Sphenodesme."

Note.—Since the completion of the Families of the Gamopetalæ, a paper has been read before the Linnean Society by Mr. H. N. Ridley, F.R.S., on a "Collection of Plants made by Messrs. H. C. Robinson and L. Wray on Gunong Tahan, Pahang." It describes a number of new species, and should be consulted by all workers who may make use of the 'Materials for the Flora of the Malay Peninsula.' It was published in Linn. Soc. Journ. Bot. XXXVIII. 301 et seq. (1908).

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